

NASA Technical Memorandum 109928

NASA STI Program Seminar

September 29, 1994

Electronic Documents



National Aeronautics and Space Administration
Scientific and Technical Information Program
Washington, DC 1994

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NASA STI PROGRAM
NASA STI PROGRAM SEMINAR

Electronic Documents

September 29, 1994
10:30 a.m. - 4:00 p.m.
NASA Headquarters

Welcome and Introductions

Terese Ohnsorg
NASA STI Program

Electronic Documents Management at the CASI

Roy Stiltner
NASA Center for AeroSpace Information

The Impact of Electronic Publishing on User Expectations and Searching

Gary Marchionini
College of Library and Information Services
University of Maryland

Image Record Management

Don Willis
I-NET

Secondary Publisher Considerations for Electronic Journal Literature

Andrea DiDonato
BIOSIS

The Technical Manual Publishing On Demand System

Steve Sherman
Defense Printing Service

Welcome and Introductions

Terese Ohnsorg
NASA STI Program
Washington, DC

Electronic Documents Management at the CASI

Roy Stiltner
NASA Center for AeroSpace Information (CASI)
Linthicum Heights, MD

Roy Stiltner provided a comprehensive look at the multifaceted program underway at the CASI to implement electronic documents management — where it is and where it's going. Stiltner emphasized that CASI efforts extend far beyond simply modernizing automatic data processing (ADP) capabilities and, in fact, include technological and workflow upgrades at the infrastructure level. All of these initiatives complement other modernization efforts underway at the facility.

The program's objectives include improving NASA researcher access to STI, minimizing waste and trimming costs, and eliminating or at least drastically reducing environmental hazards caused by the use of processing chemicals and related materials.

All of these efforts are unfolding in conjunction with similar activities at NASA Centers and across a broad range of NASA STI exchange partners.

Stiltner's presentation included a discussion of steps in capturing information for a bibliographic record in paper and microfiche (current and proposed), and both a general and a detailed conceptual look at electronic documents management at the CASI in terms of STI acquisition, processing, and dissemination. Closing visuals highlighted the NASA STI Program's ongoing migration to an electronic document management system rooted in state-of-the-art communications technology.

Electronic Document Management

Center for AeroSpace Information

- **Objectives**

- **Provide improved access of scientific information and materials to NASA scientist and engineers**
- **Permit improved workflow processes and procedures**
- **Minimize waste and reduce the cost of producing and distributing printed material**
- **Eliminate or severely reduce environmental hazards caused by the use of chemicals and other production materials**
- **Support and compliment other modernization efforts underway at the CASI**



- **Coordination With NASA STI Community**

- **NASAWide Electronic Publishing System -- STI Electronic Document Distribution**

- **GSFC**

- **LeRC**

- **ARC**

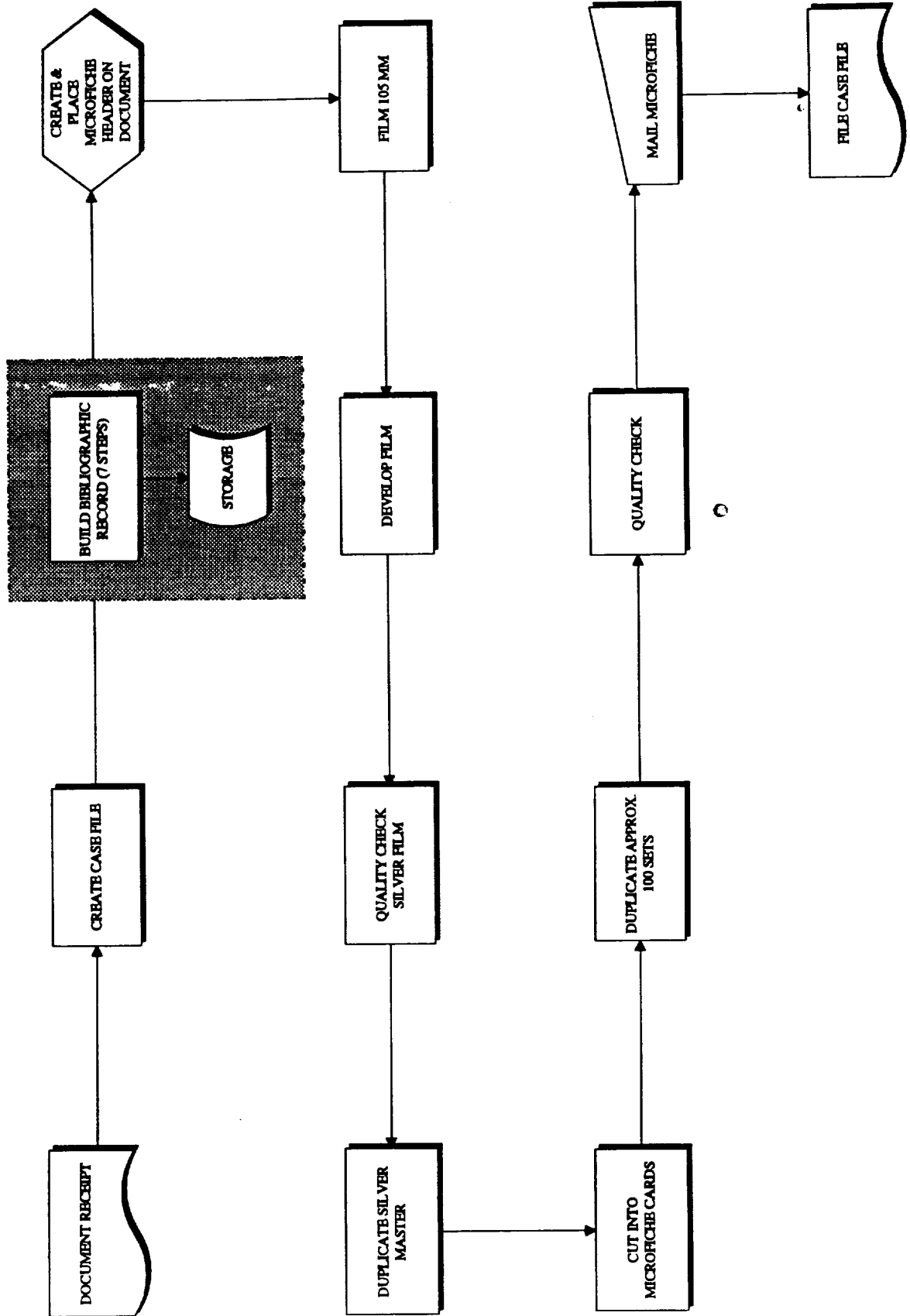
- **LaRC**

- **Other Centers**

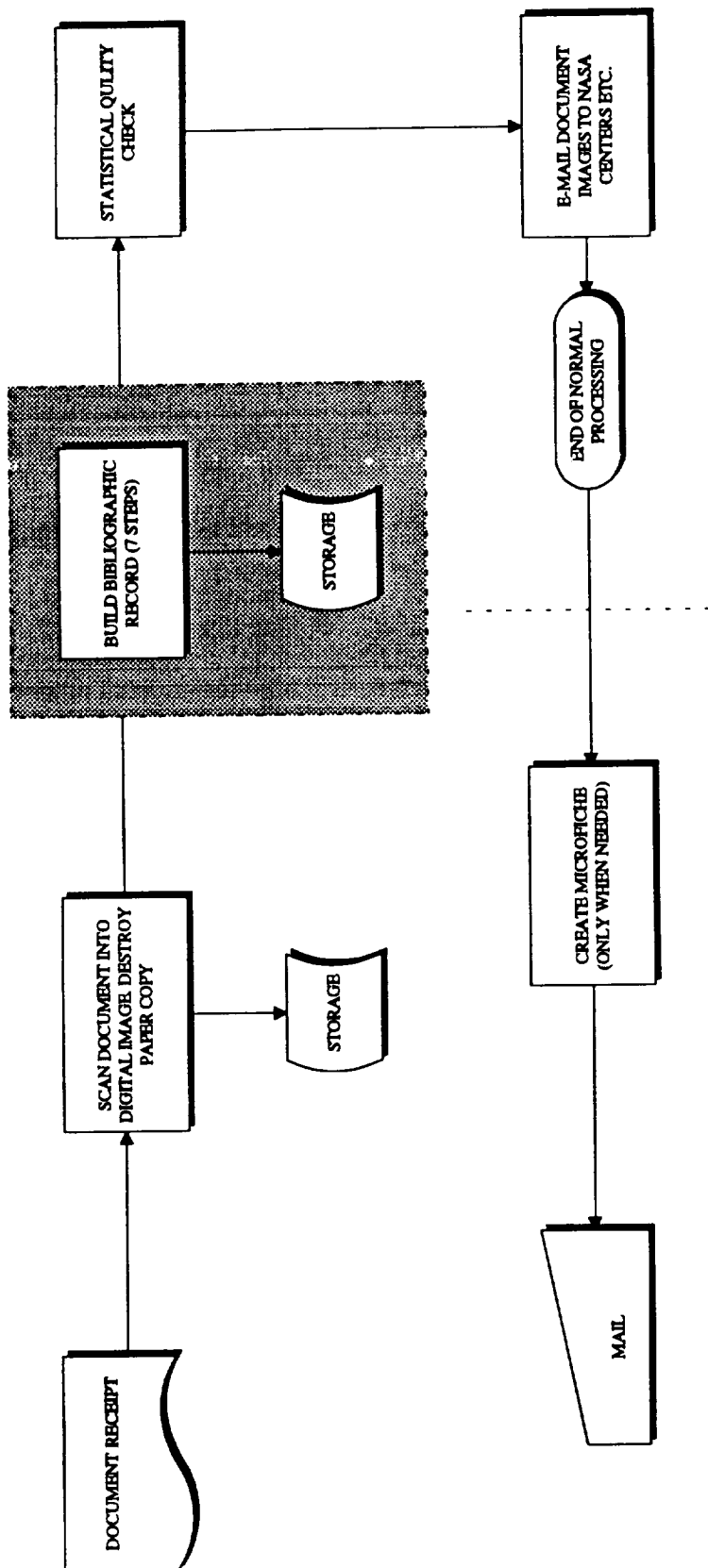
- **Exchange Partners**

Workflow

**CASI WORK FLOW
PAPER COPY / MICROFICHE COPY**

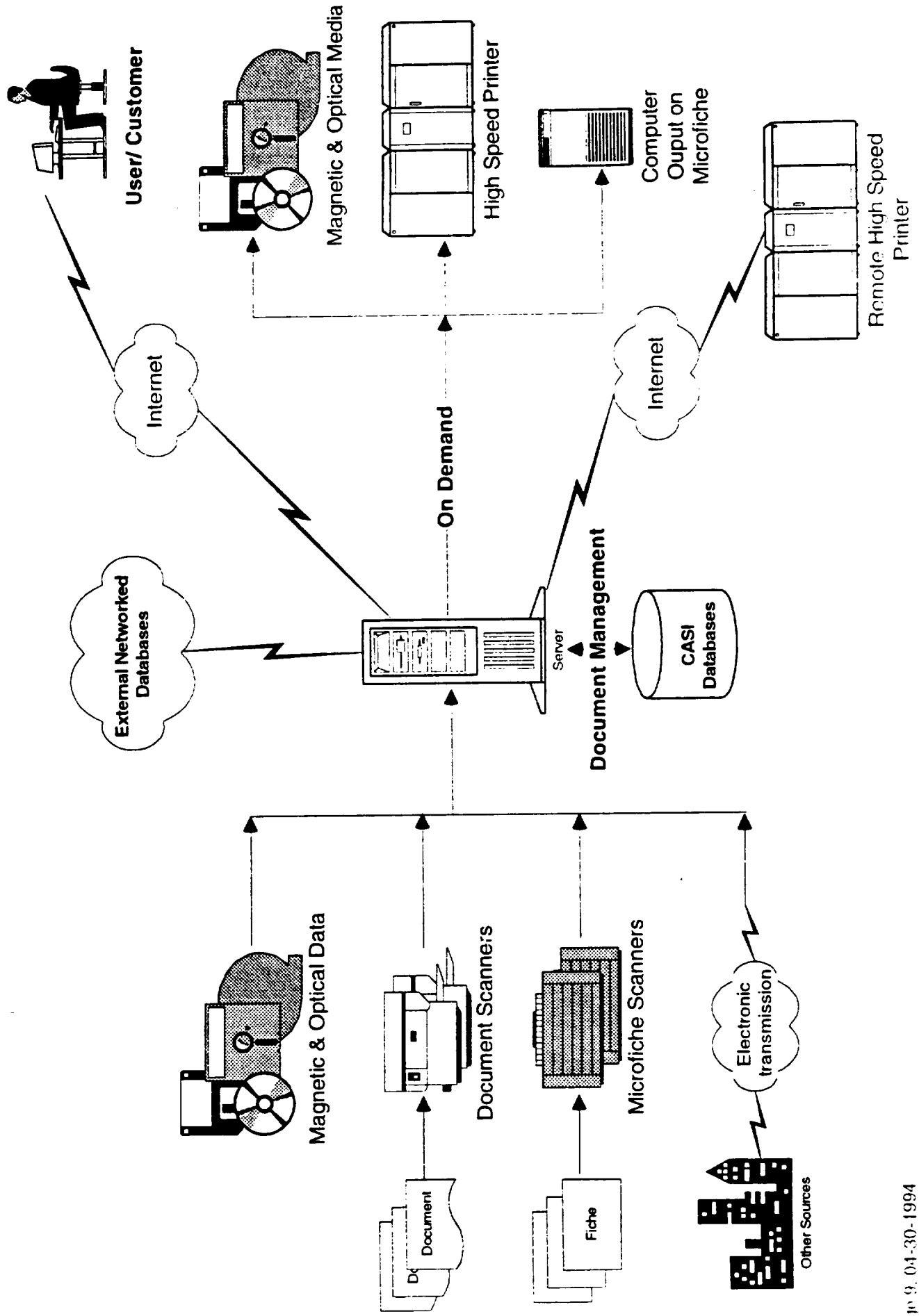


**CASI WORK FLOW
ELECTRONIC IMAGE (PROPOSED)**



Concept

Electronic Document Management

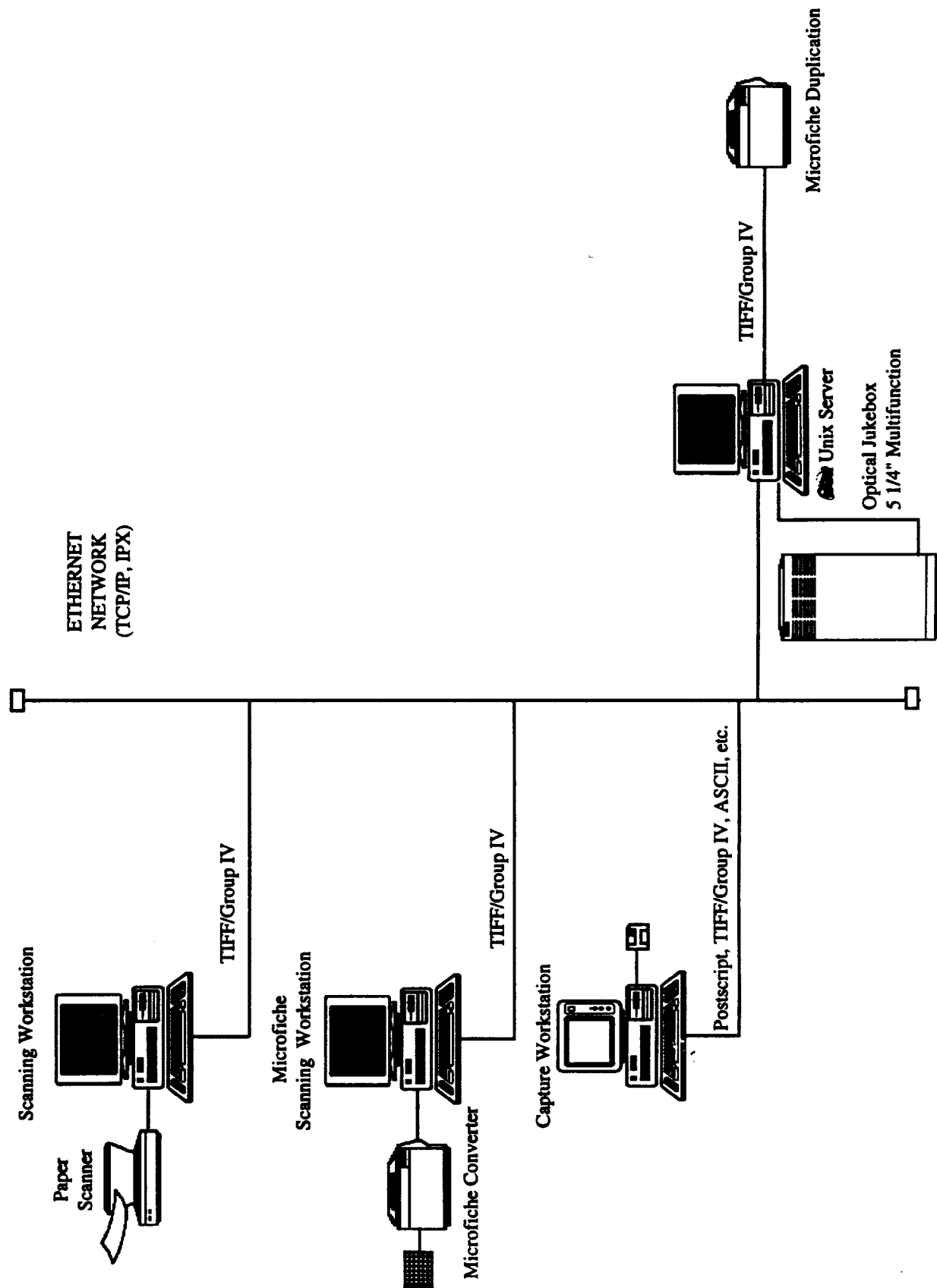


- **Functional Requirements**
 - **Information Acquisition**
 - **Information Transformation (Conversion & Storage)**
 - **Information Retrieval & Dissemination**

Detailed Concept

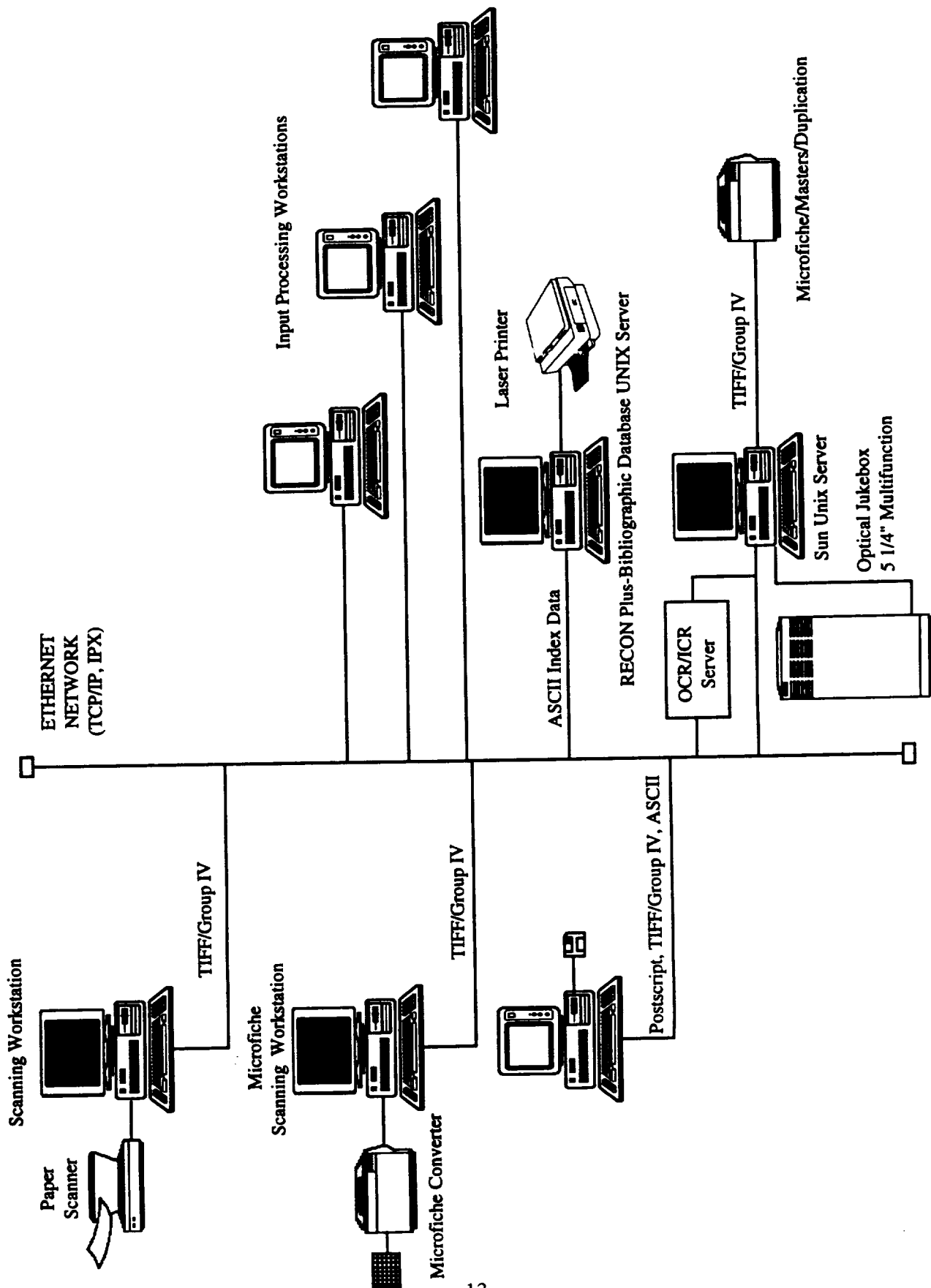
CASI ELECTRONIC DOCUMENT MANAGEMENT SYSTEM

Document Capture



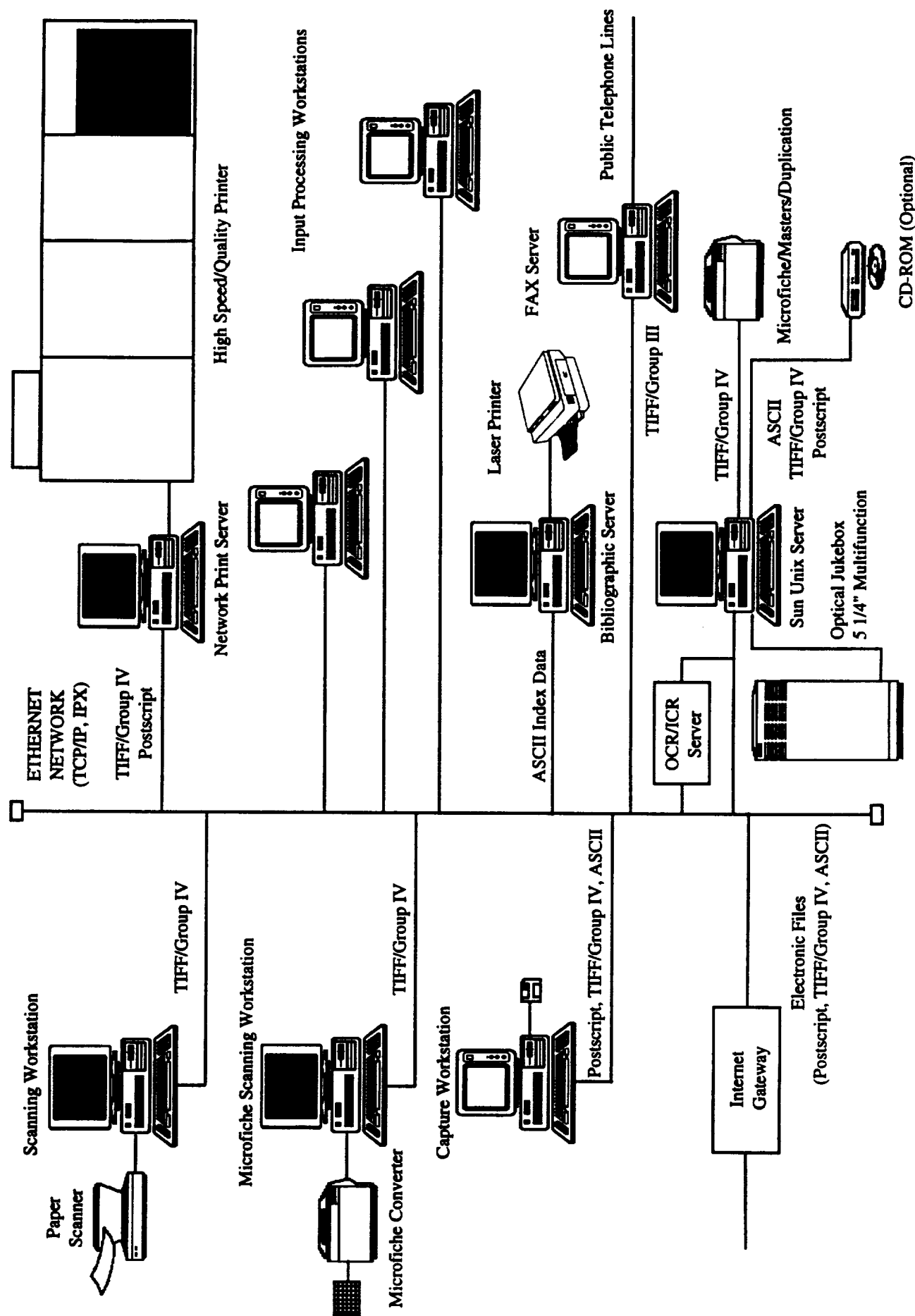
CASI ELECTRONIC DOCUMENT MANAGEMENT SYSTEM

Document Processing



CASI ELECTRONIC DOCUMENT MANAGEMENT SYSTEM

Document Dissemination



The Impact of Electronic Publishing on User Expectations and Searching

Gary Marchionini

College of Library and Information Services
University of Maryland

Gary Marchionini offered a look at the world of electronic documents. He recounted trends in electronic publishing, especially the tremendous growth in end users and such related developments as listservs and news groups; electronic journals; such for profit services as America Online, Opus Global, and Dialog; and the delivery of government data via the Internet.

After examining an array of interfaces for electronic text and the special challenges and opportunities of electronic publishing (including the as yet unresolved issue of how to handle chargebacks for copyrighted material), Marchionini suggested new roles information specialists must adopt to survive in this brave new world of the information age.

His envisioned roles require that information specialists develop greater facility with a range of specialized skills; enlarge their roles as teachers, information consultants, evaluators, and validators; and hone their expertise as entrepreneurs for new information products and services.

He suggested that the forte of information specialists is services, not products. In the coming years, Marchionini predicted an as yet unrecognized array of new markets that will likely emerge for these services.

Marchionini then focused on the capabilities offered by one particular search engine, the Wide Area Information Server (WAIS). He alluded to research he and several colleagues have conducted which identified both WAIS advantages and disadvantages.

Marchionini concluded, perhaps providentially, that this is the golden age of opportunity for information specialists. If the current opportunities are handled properly, information specialists will flourish in the coming decades. If not, they will disappear.

Impact of Electronic Publishing on User Expectations and Searching

Gary Marchionini, PhD
College of Library and Information Services
University of Maryland
march@umdd.umd.edu

NASA STI Seminar

Electronic Documents

September 29, 1994

Trends

More end users

Government Data via Internet/WWW (NII/GII)

Primary Data Sets (NASA, LC, GPO, etc.)

Indexes and Directories (e.g., OPACs)

Specialized corpuses

Listservs & News groups

Electronic Journals

For Profit Services (e.g., Dialog, America Online, Opus Global)

Tools for access (WAIS, gopher, Mosaic, Harmony, Greenpages)

G. Marchionini, U. of Maryland

Interfaces for Electronic Text

- **Learnable and Usable Systems**
Direct manipulation, help, adaptability
- **Searching and Filtering Tools**
multiple indexes, TOCs, string search, SDI profiles
- **Browsing Tools**
levels of representation, zooms & pans
- **Reading Tools**
cut and paste, logs
- **Value added features**
multimedia, links

Challenges and Opportunities

1. The NET blurs document boundaries
2. Common interfaces are LCDs
3. Black boxes and Glass boxes
4. Real costs (\$ and time)

Consider two modes of publication

Shared or Public
(accessible via NET)

Personal or Private
(owned by individuals)

Roles for Information Specialists

- 1. Expanded need for specialized skills**
maximize recall or precision for critical needs by using
advanced tactics (e.g., proximity, field limits, thesauri, etc.)
open the opaque box

professional discipline avoids NET seduction and
disorientation
- 2. Expanded roles as teachers and consultants**
- 3. Expanded roles as evaluators, validators**
- 4. Expanded roles as entrepreneurs for new information
products and services**

G. Marchionini, U. of Maryland

Focus on Services, Not Products

- 1. The NET is about communication, NOT information delivery!**
simplex dissemination is moving to full duplex
asynchronicity is blurring into synchronicity
point to point is moving to multicasting
- 2. There will be MANY usage-sensitive charges in the NET**
- 3. New markets will emerge for services**
- 4. People like to own THINGS, publishers must provide a mix or products and services**

G. Marchionini, U. of Maryland

Possibilities with WAIS

1. Easy to use
2. Inexpensive (relative to time)
3. No query language required
4. Typically gives SOME hits
5. Editable/copyable/pastable functionality
6. Combining multiple databases

WAIS Results

1. Less Recall/Precision Control
2. "Black box" effect
3. Highly learnable & usable
4. Relevance feedback not useful in our limited trials
5. Distribution of relevant documents in the ranked lists not predictable from ranking
6. Query length seems important (task and database variable)

Implications

1. What strategies are useful?

query length

relevance feedback

multiple servers

query report and user understanding

2. What evaluation metrics are useful?

time

queries

iterations/screens/windows

records viewed/saved

cost

satisfaction

Current and Future Steps

Underway

1. Replicate terse searches with Dialog Target
2. Develop strategies for comparing ranked lists of output

Pending

1. More analysis of query size, especially considering the uses of cut and paste abstracts or paragraphs
2. More analysis of relevance feedback effects
3. Examine interface effects
learnability, usability
browsing, cost effectiveness
4. Develop guidelines for information-seeking strategies in highly interactive network environments such as WAIS
5. Develop interfaces for controlling the multiplicity of variables in advanced IR applications (an information-seeking workstation)

Marchionini, UMCP

Image Record Management

Don Willis
I-NET

Don Willis offered a wide-ranging look at image databases and online document delivery. He noted that the explosion of information has created a need for tools to facilitate the access and processing of these exponentially increasing levels of information. Similarly, there is a need for electronic document delivery through a variety of means.

After looking at document delivery today, tomorrow, and further into the future, Willis focused on the image component of the document delivery system, saying there simply is no other technology available now, or in the near future, that can provide this capability as cost-effectively. Imaging, for instance, can represent chemical and mathematical formulas and symbols, graphics and line drawings, halftone pictures, foreign languages, and built-in editorial intelligence.

Willis said that putting the image database on CD-ROM, with its wide array of capabilities, is a logical outgrowth of this reality. A detailed look at the many facets of CD-ROM technology and its potential followed, proceeding from this premise: CD-ROMs are an emerging technology that can support the creation, storage, and network dissemination of large volumes of digital data ... a capability that is essential for the successful implementation of information and imaging distribution management concepts.

Willis referred to the tremendous storage capacity of digitized page images on CD-ROMs. For instance, a one-year stack of all the journals indexed by medicine would rise to more than 800 ft, compared with a dramatically smaller pile of only 960 CD-ROMs holding the same quantity of information. From another perspective, CD-ROM strengths are reflected in their improved economy (stated in cost per megabyte) compared with a variety of media, including removable hard disk, paper, floppy disk, and mag tape.

Looking to the future, Willis discussed such diverse storage possibilities as three-dimensional storage, storage at the atomic level, and optical computing.

The Information Explosion

- **Journal literature is the primary mode of distribution for scientific information**
- **The number of published journals doubles every 15 years**
- **There were over 500 new journals introduced in 1990 and 1991**

What's needed ----- tools to facilitate access and processing

The Need for Electronic Document Delivery

- 1. No library is self-sufficient**
- 2. Access to a copy of the article is usually necessary to satisfy user research needs**
- 3. Reduces “satisfaction time”**
- 4. Reduces cost**

Types of Electronic Information Access

- **Bibliographic database of article citations
(on-line or CD-ROM)**
- **Full text ASCII databases (on-line or CD-ROM)**
- **Facsimile transmission of journal articles**
- **Image databases on CD-ROM**
- **Combination of above**

Document Delivery -- Today

- Information Search
 - Paper indexes, online, local CD-ROM databases
- Document Search
 - Library Shelves, microfilm archives
- Document Ordering
 - Other libraries, commercial sources
- Document Receipt
 - Days to weeks

Document Delivery -- Today

- Mostly manual
- Often complex
- Time consuming
- Escalating costs
- Non-Integrated
- Mostly unresponsive

Document Delivery -- Future

- CD-ROM Image databases of journal articles

coupled with

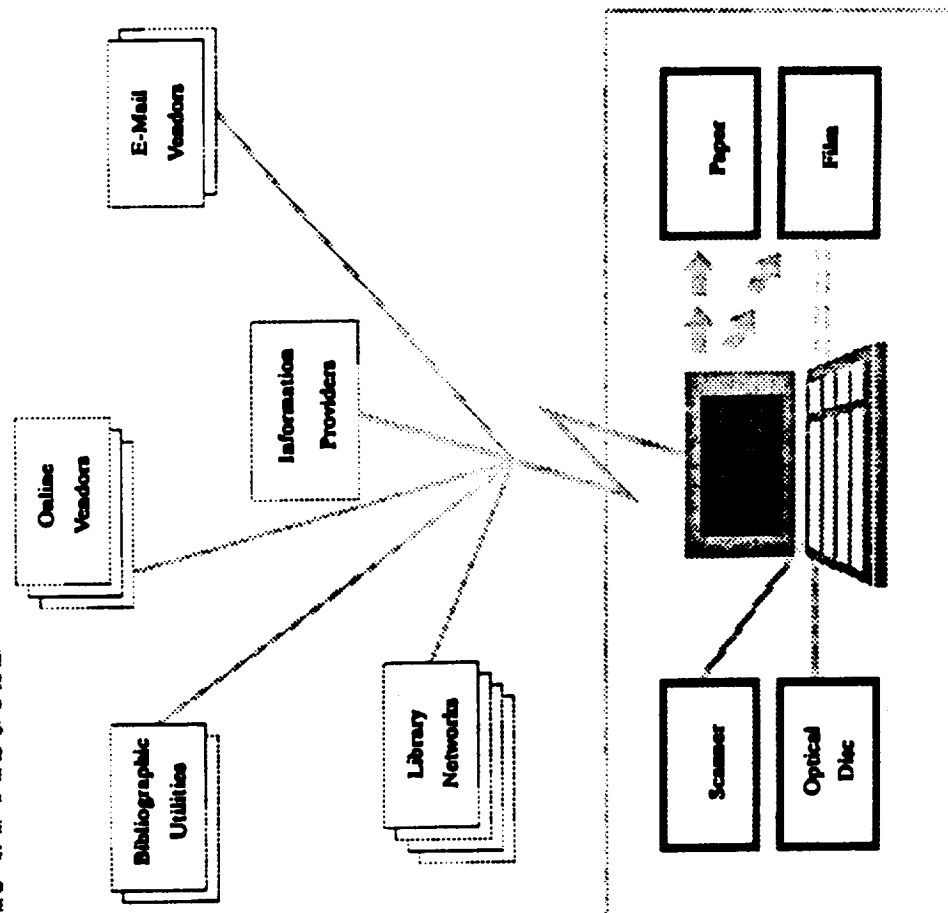
- Remote document delivery
 - o Fax
 - o Network

Document Delivery -- Future

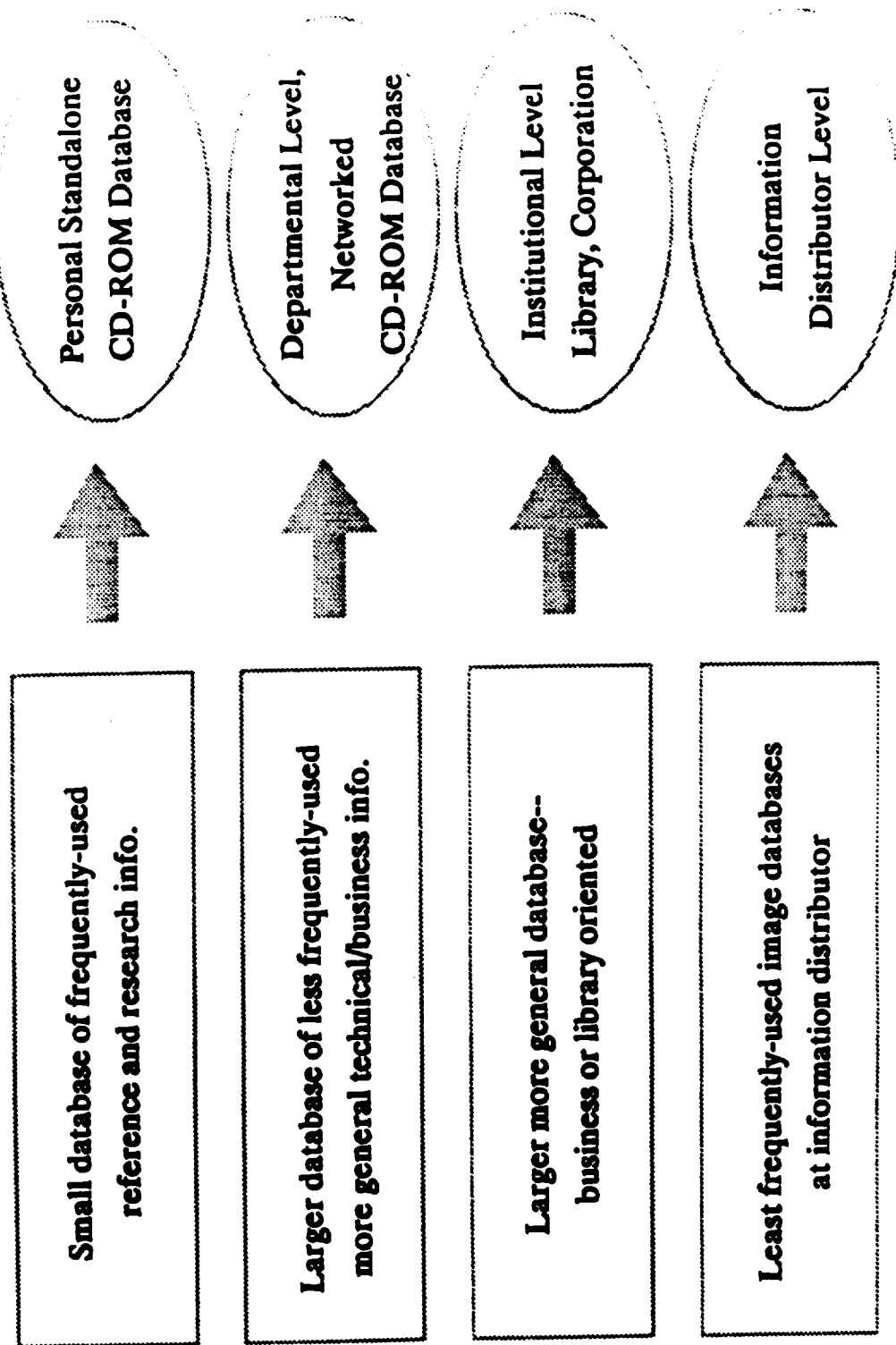
- Highly integrated
- Easy to operate
- Low cost per document
- Responsive
- Delivery to desktop

The Hybrid End-User Access System

Single Point of Access



Hierarchy of Image Database Access



Communication & Article Delivery

**From all levels of the hierarchy document delivery
and resource sharing possible using networking
and facsimile technology**

THE PAGE IMAGE FORMAT

Imaging:

***... The least common denominator
.....for information delivery***

Imaging can represent:

- **Mathematical formulas and symbols**
- **Chemical formulas and symbols**
- **Graphics and line drawings**
- **Halftone pictures**
- **Foreign languages**
- **Built-in editorial intelligence**

There is no other technology available now, or in the near term future, that can provide this capability at a similar cost per page

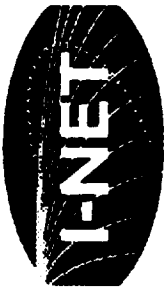
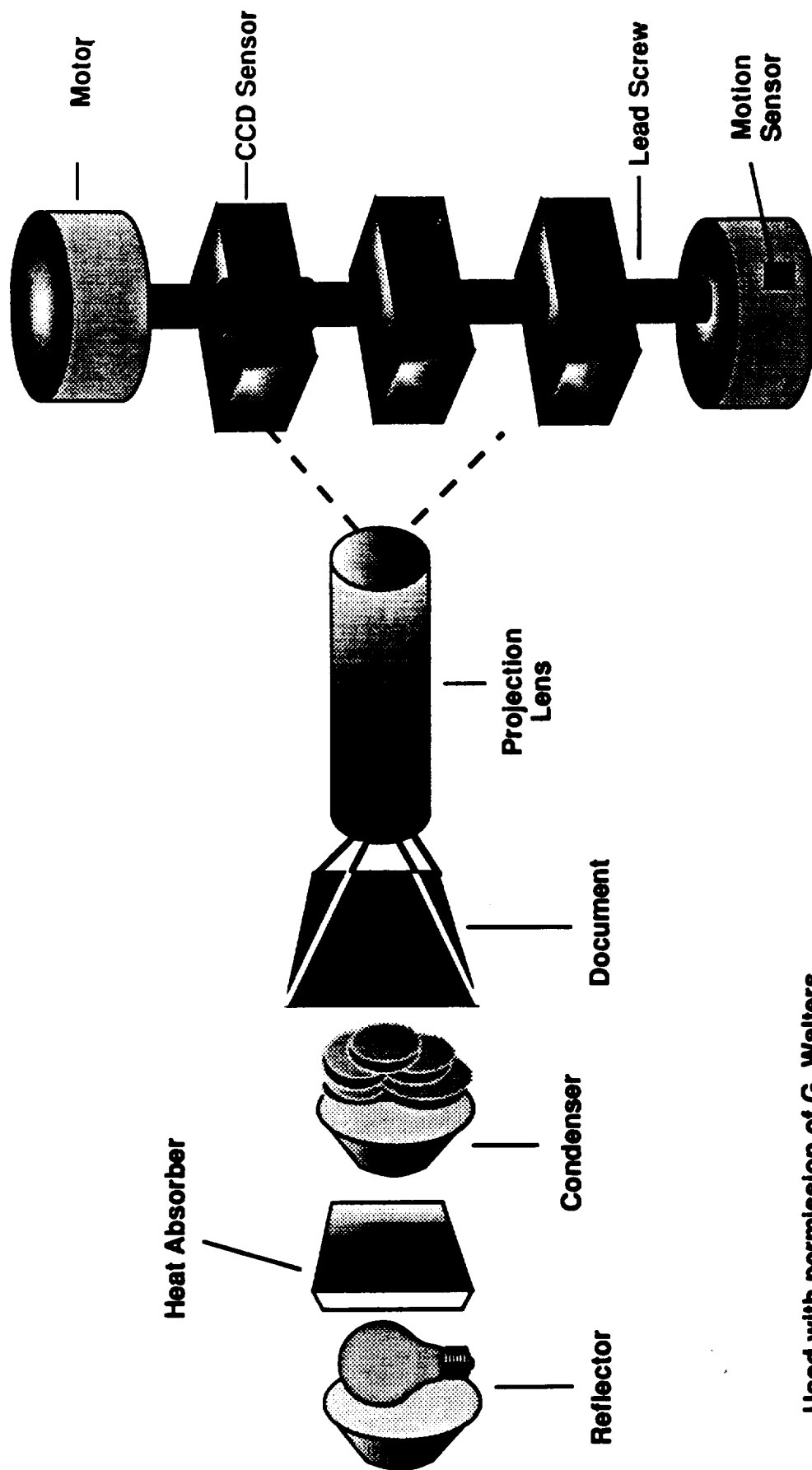


DIAGRAM OF CCD SCANNER



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Rothchild Consulting



PROPRIETARY DATA

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PUTTING IMAGE DATABASE ON CD-ROM

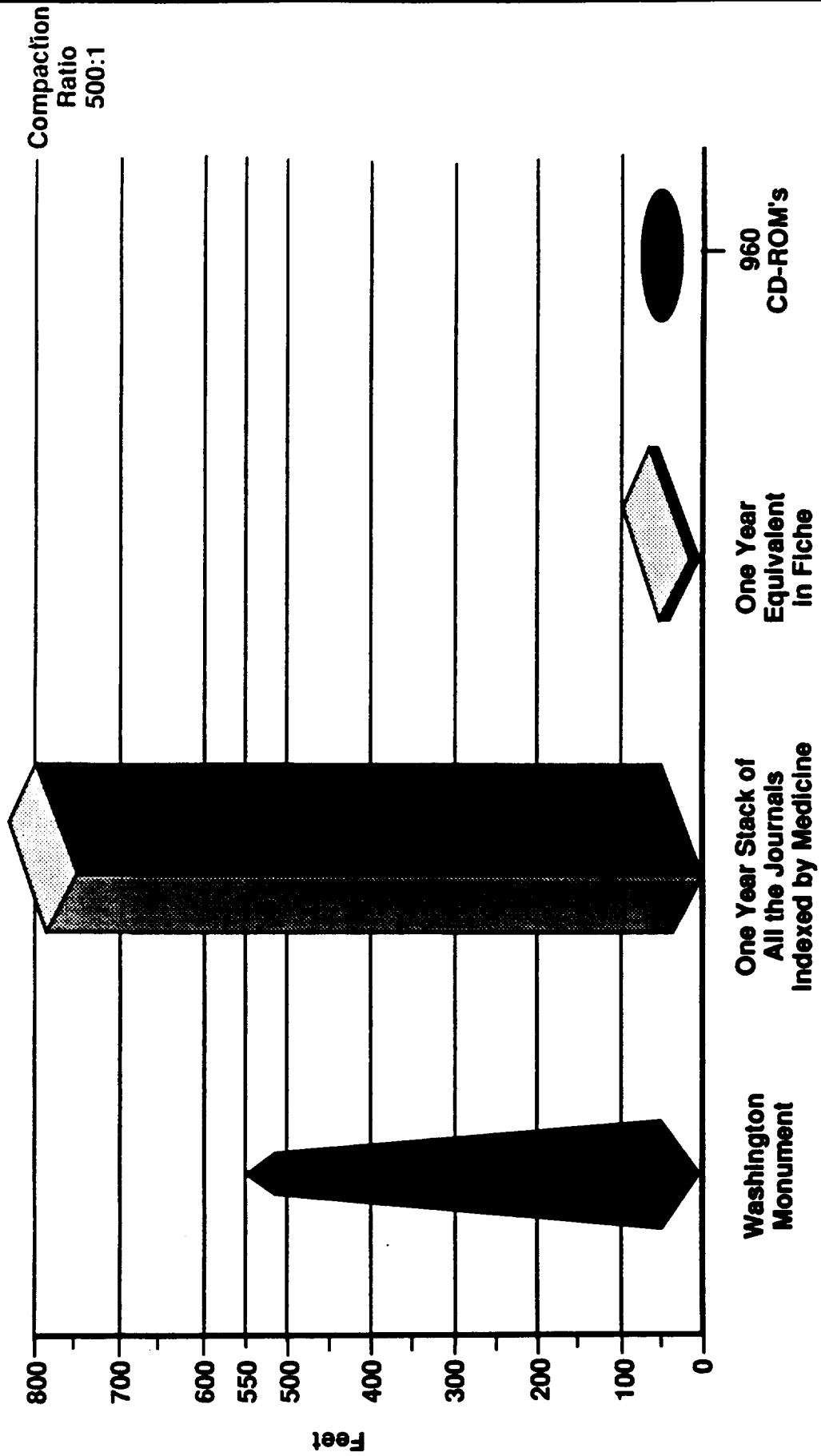
Creation:

- Scanning
- Compression
- Temporary storage
- CD-ROM build (ISO 9660 format)
- Mastering and Replication

Retrieval:

- Decompression
- Printing/Display

STORAGE OF DIGITIZED PAGE IMAGES



PROPRIETARY DATA

000448 54

CD-ROM

Premise

CD-ROM is an emerging technology that can support the creation, storage, and network dissemination of large volumes of digital data which is essential for the successful implementation of Information and Imaging *Distribution* Management concepts.

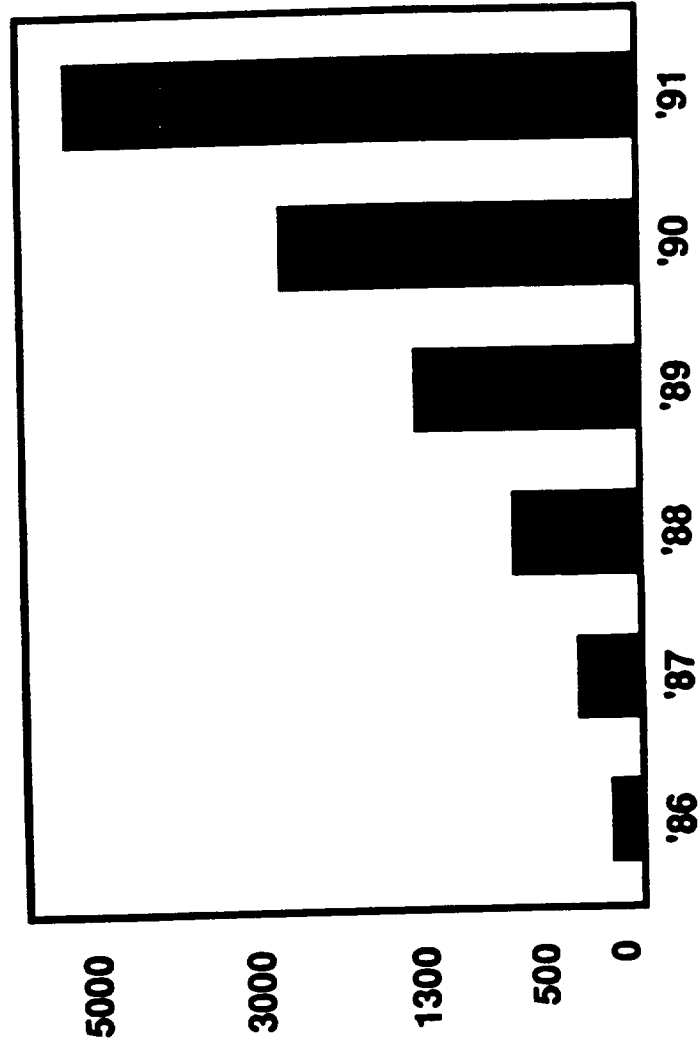
Does CD-ROM handle different types of data ?

- Graphics (Raster Images) plus :
Text & SGML
Data
Software
Vector Images
Audio & Video..i.e. MultiMedia**

What are the Trends in the Industry ?

- Growth in # of Discs, # of Drives,
- Decreasing Costs
- Standards Driven
- Networkable now, Jukeboxes coming
- Application diversity
- All industries affected

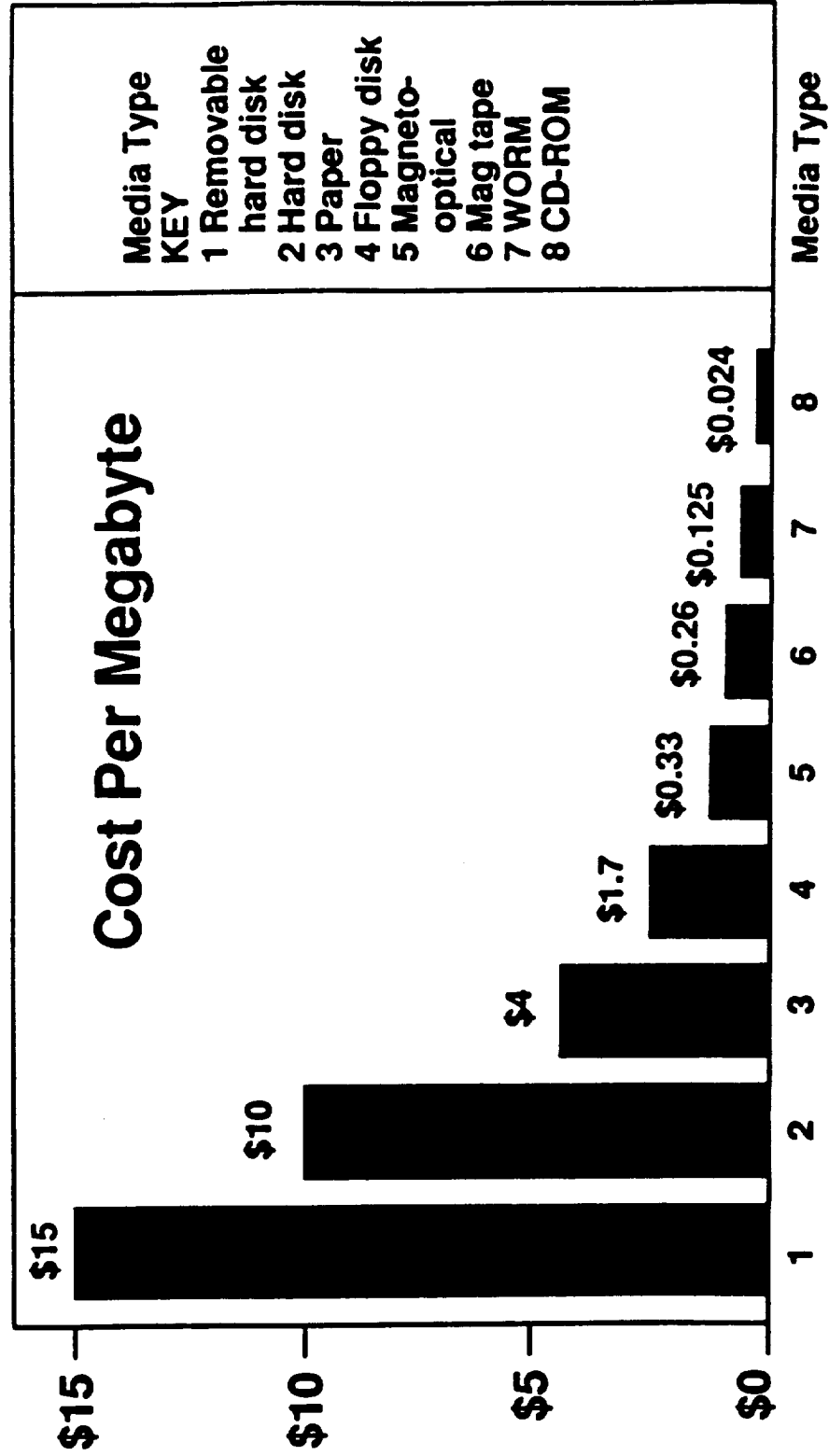
CD-ROM Titles



Source: Optical Publishing Association

AIIM CD-ROM Task Force

CD-ROM INDUSTRY DRIVER



Source: Meridian Data (1988)

US Government Conclusions:

Estimated Costs Per Library Per Year for Distribution of the Bound Congressional Record to Depository Libraries, Various Formats

	Paper Copies	Paper Index	Microfiche Copies	CD-ROM Copies
Printing Cost	\$569.70	\$30.30	-	-
Production Cost	-	-	\$28.27	-
Duplication Costs	-	-	-	\$3.00
CD-ROM	-	-	-	\$5.00
Floppy Disk	-	-	\$.85	\$1.49
Postage	\$55.30	\$3.13	\$54.50	\$.06
Handling	\$7.83	\$.31	-	\$.50
Documentation	-	-	-	-
Total	\$632.83	\$33.74	\$83.62	\$10.05

Source: U.S. Congress. Office of Technology Assessment,
Informing the Nation: Federal Information Dissemination in an Electronic Age.

Can CD-ROM be Updated ?

Now : CD-ROM can be supplemented with magnetic data or a new CD-ROM can be created

Future: CD Recordable is on the horizon

Orange Book update to ISO 9660 provides Appendable CD-ROM's

Are CD-ROM Drives fast or slow ?

Slow : Compared to Magnetic disk (or Rewritable)

Fast: Compared to manually searching 680 MegaBytes of data or text

Fast Enough: To add a lot of value

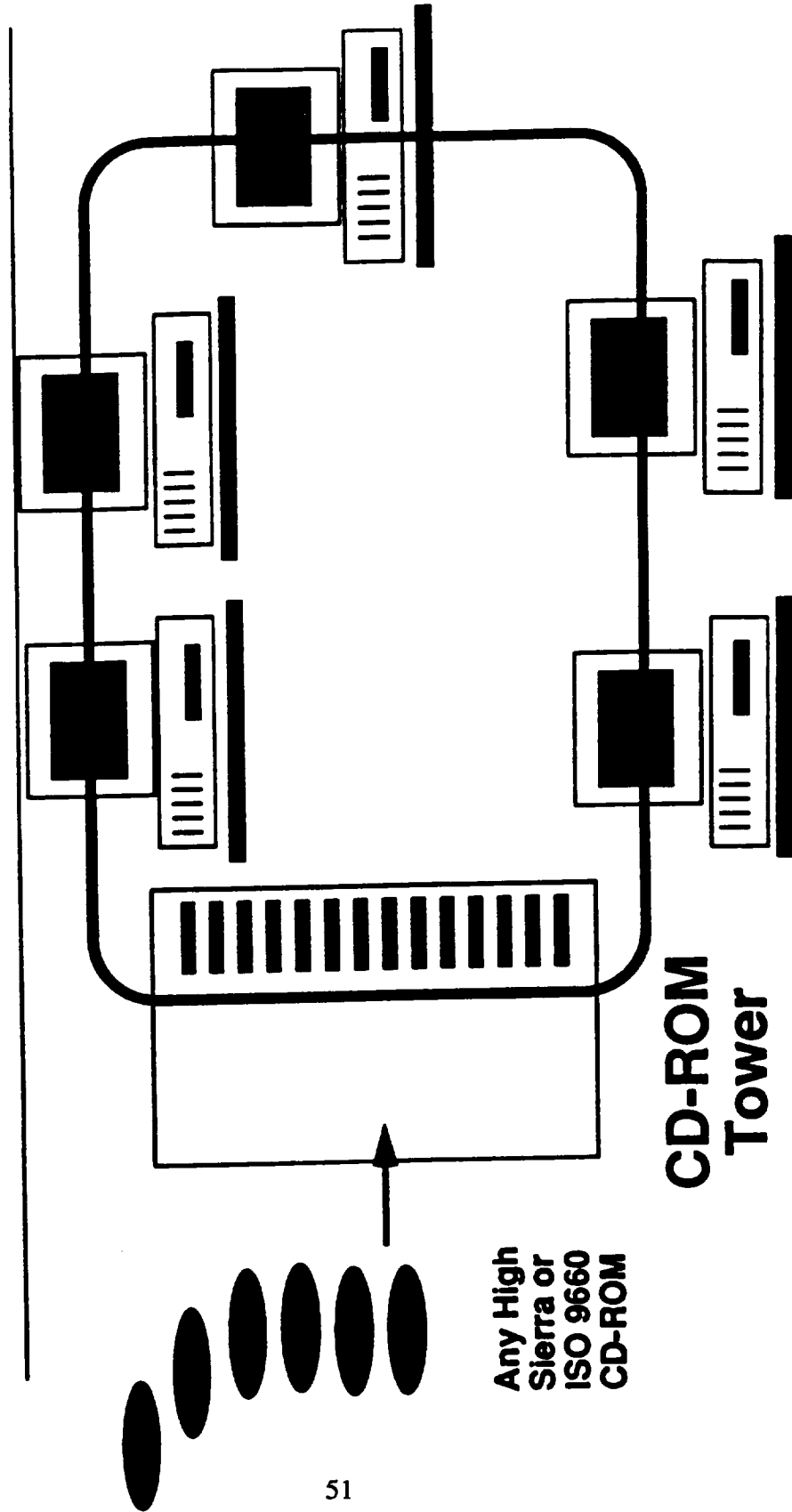
AIIM CD-ROM Task Force

Are CD-ROM's Networkable ?

Yes :

Networkable to a Local Area Network (LAN)
“ Mainframe - terminal Network
“ Wide Area Network (WAN)

CD-ROM Networking



Where does MultiMedia fit with CD-ROM ?

- **Logical extension of text plus graphics**
- **May supercede videodisc**
- **Many CD variations to accomodate audio, video**
- **Success linked to compression**
- **Current use in training and point-of-sale**

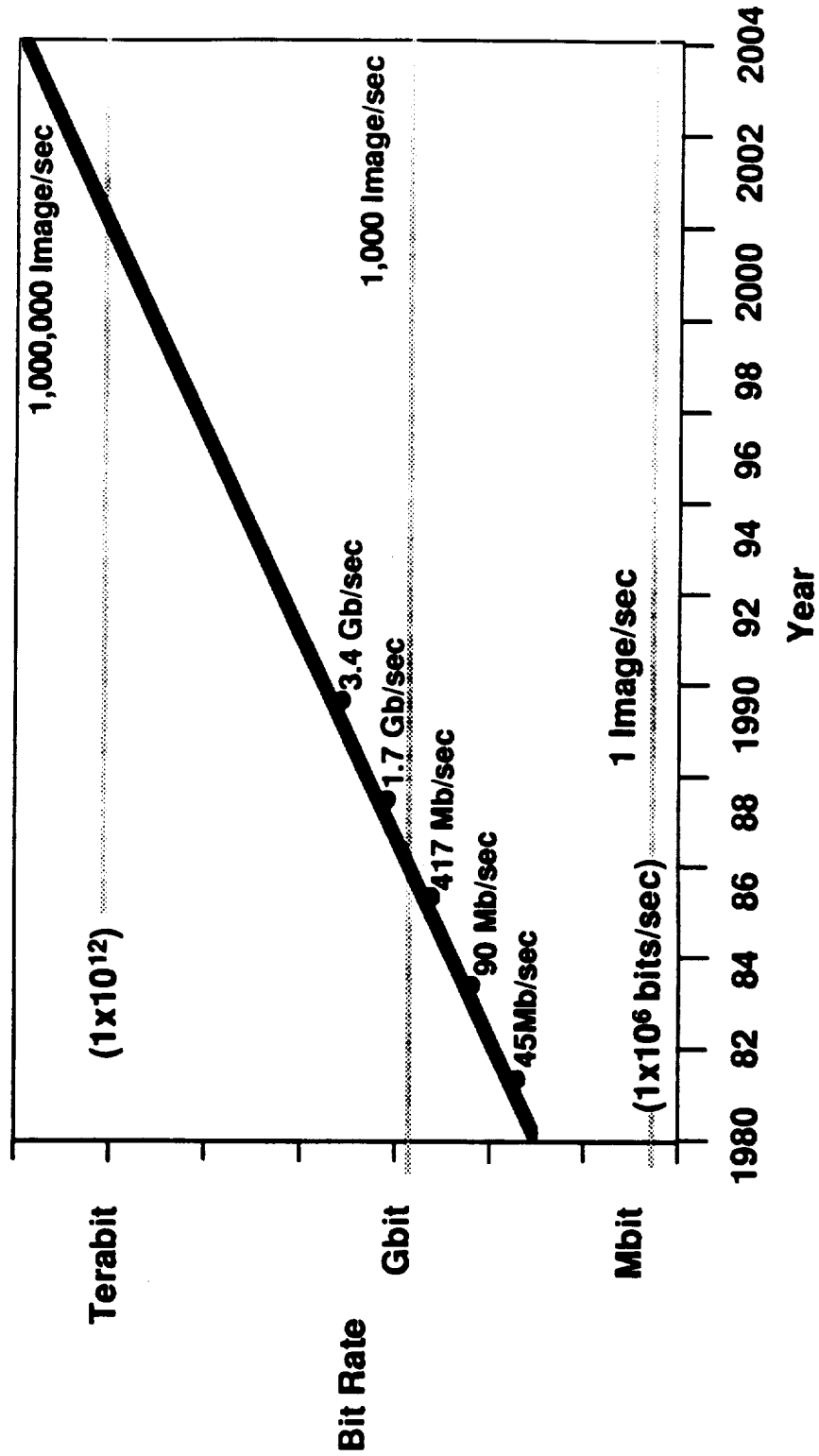
EVOLUTION OF TECHNOLOGY

Communications:

- National network funded 1991
 - National Research Education Network (NREN)
- Bandwidth increases - Gb capacities by 1995
- Cost decreases
- By 2000 networking is a way of life
- Fiber optic cable to home by 2010
- Cable TV, communications (voice and data) , fax, value-added networks MERGE
- Home networks using electric lines by 1995



INCREASING COMMUNICATION BANDWIDTH



Used with permission from AT&T Bell Labs
 * Images are compressed at 10-1



TRANSMISSION TIMES FOR TYPICAL DOCUMENTS

	Voice and 2400 bps	DDS- Wideband 56 kbps	T-1 1.5 Mbps	Fiber * Optics 1.7 Gbps
Document				
Page	8 sec	.34 sec	.013 sec	1.13x10 ⁻⁵ sec
Book	.67 hr	1.7 min	3.84 sec	.0034 sec
Dictionary	2.3 days	2.38 hrs	5.3 min	.28 sec
Encyclopedia	5 days	11.6 hrs	5.15 hrs	.61 sec
Local Library	7.4 years	116 days	4.32 days	5.49 min
College Library	74 years	3.17 years	43.2 days	.92 hrs
Library of Congress	1,900 years	815 years	3 years	23.5 hrs

* Currently possible in laboratory environment
NOTE: Used with permission from AT&T



PROPRIETARY DATA

000442-88

EVOLUTION OF TECHNOLOGY

The Future of CD-ROM

- **Transfer rate increases:**
2x - 1992 - 300kByte/sec.
4x - 1994 - 600 kBytes/sec.
- **Capacity increases**
2 - 4x within next two years
(increase laser bandwidth {spotsizer})
- **Writable CD-ROM**
- **Smaller Multi-functional Drives and Media**



EVOLUTION OF TECHNOLOGY

Personal Computer:
PC introduced 1981 - 10 years ago

<i>Year</i>	<i>Microprocessor</i>	<i>MPS</i>	<i>#Transistor</i>	<i>Power Factor</i>
1981	8088		29,000	1
1982	80286	1	130,000	5
1985	80386	3	275,000	25
1989	80486	15	1,000,000	75
<i>Future</i>				
1993	80586*	100	4,000,000	250
1996	80686	400	25,000,000	1,000
2000	80786	2,000	100,000,000	5,000

* Mainframe equivalent



EVOLUTION OF TECHNOLOGY

The Thirteen Year Old PC:

	Original PC	Contemporary PC	Difference
RAM	16KB	8 MB	X 500
CPU	8088	80486	X 14
CLOCK	4.77mhz	66mhz	X83
MIPS	0.3	25	
Disk	None	150 MB	X 9
Floppy	160 KB	1.44 MB	
Display	Character based monochrome	Graphical color	
Software	5	22,000	X 4,000
Cost	3,000	\$2,500	[- 20%]

Sources: Wall Street Journal, 8/13/91, A7 Scannell, Ed;
 "The Secret History of the IBM Gamble", Infoworld 8/12/91 page 47.
 (Updated by Aurthor 9/94)

I-NET

GENERAL ADVANCES IN TECHNOLOGY:

- Technology advances by a factor of 10 every 10 years
- Number of transistors in a chip triples every 2-3 years
- A single chip 386 available now (Computer on a Chip)
- Computer hardware costs decrease by 25%/year
- Network bandwidth increasing dramatically: 100 Mbps LAN's by '95 commonplace
- Fiber LAN to desktop by 2000: unlimited bandwidth
- Optical tape stores one terabyte (equivalent of 1500 CD-ROM's) 60 second end-to-end search speed
- 4mm and 8mm hylical scan tapes: quadruple density
- Fax machines as common as copier

Faster — Cheaper — Smaller — More Powerful

I-NET

PROPRIETARY DATA

000442-71

A LOOK INTO THE FUTURE

Three Dimensional Storage Storage at the Atomic Level Optical Computing

- **Philips Research:**
 - Creating pits in silicon 10,000 times more dense than optical disc (Electronics 3/90)
- **University of California:**
 - Storage of data in 3-D polymer cubes
 - One trillion bits/cubic cm.
 - 100,000 times more dense than optical disc (Computer Design 11/90)
- **IBM Scientists create one atom switch**
 - 1,000 times more dense than current chips (Wall Street Journal 8/15/91)
- **Researchers isolate bacteria protein ... [to] miniaturize computers**
 - Syracuse University researchers create 3-D optical storage
 - Entire Library of Congress on six (6) one cm³ cubes (Wall Street Journal 9/4/91)
- **Hundreds of trillions of bytes on ... CD-ROM size surface**
 - Oak Ridge National Laboratory (Mini-Micro Systems 3/89)
- **AT&T Bell Labs develop optical computer**
 - Photons vs. electrons (Time, 2/12/90)

Evolution of Technology

Communications:

**All of the world's information will someday
be accessible instantaneously**

Bill Gates calls it

..... "Information at Your Fingertips"™

Secondary Publisher Considerations for Electronic Journal Literature

Andrea DiDonato
BIOSIS

As access to networks by end users increases, more and more information, including journals, is being published in electronic form.

Andrea DiDonato examined key considerations for secondary publishers in this modern publishing environment.

Offering a case study from BIOSIS dealing with the *Online Journal of Current Clinical Trials*, DiDonato recounted her organization's experience with this online literature as its initial venture with the secondary publishing of electronic journal literature. BIOSIS soon discovered the tremendous unevenness of this medium, offering as it does quick access — but unsteady availability — to information.

DiDonato provided a variety of relevant issues for secondary publishers of electronic journals to consider, including inconsistency in format and delivery. She also noted the need to standardize the processing system and address questions of copyright and liability.

DiDonato concluded that electronic journals are becoming commonplace and, therefore, important sources of information that responsible secondary publishers cannot ignore.



BIOSIS®

Secondary Publisher Considerations for Electronic Journal Literature

Andi DiDonato
September 29, 1994

Secondary Publisher Considerations for Electronic Journal Literature

I. "Online Journal of Current Clinical Trials" (OJCCT)

--BIOSIS experience

II. Future Coverage of Electronic Journals

--issues to be aware of

--generalizations

III. Summary of Issues

--quality

--processing

--copyright

I. "Online Journal of Current Clinical Trials" (OJCCT)

Selection / Coverage Considerations

Post-Selection Processing Considerations

Processing Considerations

**--BIOSIS experience--vehicle for discussing
broader issues**

--elementary example--not the future mechanism

--adapted to BIOSIS requirements

Selection / Coverage Considerations

1. Selection & Retrieval

- OCLC direct hookup via Guidon software**
- monitor output--daily**
- download & print out appropriate articles**
- selectively cover contents: original research**
- don't cover: articles of editorial or philosophical nature; letters; articles from Morbidity & Mortality Weekly Reports (MMWR) (cover original)**
- dual publication of some articles in Lancet**

Selection / Coverage Considerations **(cont.)**

2. Bibliographic Citation

- based on National Library of Medicine form**
- adapted for our processing and product requirements**
- some information unique to electronic publications**
- cross-reference to Lancet abridged version**
- standards only in infancy**

ABNUM 97095917 V97 PR 110 MAR PR009 GE001 ON33040 ZOV
BIBLO OJCTE / ONLINE JOURNAL OF CURRENT CLINICAL TRIALS 0
(JAN. 14). 1994. DOC NO 113, 110 PARAGRAPHS, 7906
WORDS. * EN *
AUTHS Silagy C/ Mant D/ Fowler G/ Lodge M/
ADDR DEP. GENERAL PRACTICE, FLINDERS UNIV. SOUTH AUSTRALIA,
SCH. MED., GPO BOX 2100, ADELAIDE, SA 5001, AUL.
WORDS THE EFFECTIVENESS OF NICOTINE REPLACEMENT THERAPIES IN
SMOKING CESSATION ABRIDGED VERSION OF THIS PAPER
PUBLISHED IN LANCET 343 8889 1994 PAGE 139-142/
META-ANALYSIS SERIAL ONLINE HUMAN NICOTINE
ANTIADDICTIVE-DRUG GUM TRANSDERMAL PATCH INTRANASAL
SPRAY INHALED PREPARATION EFFICACY
CODES C21004* C07004- C10060 C12512- C14001- C16001- C18501-
C22005- C22024- C22026- C22100- C22501- S86215
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MEDIA PRINT
ISSN 1059-2725
PROD BA

10895917 BIOSIS Number: 97095917

The effectiveness of nicotine replacement therapies in smoking cessation: (Abridged version of this paper published in Lancet 343 (8889): 1994 pages 139-142)

Silagy C; Mant D; Fowler G; Lodge M

Dep. General Practice, Flinders Univ. South Australia, Sch. Med.,
GPO Box 2100, Adelaide, SA 5001, AUL

Online Journal of Current Clinical Trials 0 (JAN. 14). 1994. DOC
NO 113,110 PARAGRAPHS, 7906 WORDS.

Full Journal Title: Online Journal of Current Clinical Trials

ISSN: 1059-2725

Language: ENGLISH

Print Number: Biological Abstracts Vol. 097 Iss. 005 Ref. 063422

To determine the effectiveness of nicotine replacement therapies (NRTs) (including gum, transdermal patch, intranasal spray, and inhaled preparations) in facilitating smoking cessation, and to determine whether the effect was influenced by the clinical setting in which the smoker was recruited and treated, the level of nicotine dependency, the dosage of NRT used, or the intensity of additional advice and support offered to the smoker. Data Sources: Published trials of NRT were identified by a systematic search of 7 electronic databases, published reviews, reference lists from clinical trials, conference abstracts, smoking and health bulletins, and a bibliography on smoking and health. Unpublished trials were identified by approaching manufacturers of NRT. Study Selections: A total of 53 trials (42 gum, 9 patch, 1 intranasal spray, and 1 inhaler), with data from 17,703 patients, were included in the analyses. Only trials that assessed abstinence at least 6 months after the commencement of therapy were included. Data Extraction: Data were extracted from the trial reports by 2 authors independently. Where the methodology was unclear or the results were not expressed in a form which allowed extraction of key data we wrote to the investigators for the required information. Data Synthesis: Use of NRT increased the odds ratio (OR) of abstinence of 1.71 (95% confidence interval (CI), 1.56 to 1.87) compared with those who had been allocated to the control interventions. The OR for the different forms of NRT were 1.61 for nicotine gum (95% CI, 1.46 to 1.78), 2.07 (95% CI, 1.62 to 2.62) for transdermal patch, 2.92 (95% CI, 1.49 to 5.74) for nasal spray, and 3.05 for inhaled nicotine (95% CI, 1.42 to 6.57). These odds were not significantly higher in patients with higher levels of nicotine

dependence (Fagerstrom score $r = -0.06$), but they were largely independent of the intensity of additional support provided or the setting in which the NRT was offered.
Conclusion: We conclude that the currently available forms of NRT are effective therapies to aid smoking cessation.
Descriptors/Keywords: META-ANALYSIS; SERIAL ONLINE; HUMAN; NICOTINE; ANTIADDICTIVE-DRUG; GUM; TRANSDERMAL PATCH; INTRANASAL SPRAY; INHALED PREPARATION; EFFICACY

Concept Codes:

- *07004 Behavioral Biology-Human Behavior
- *12512 Pathology, General and Miscellaneous-Therapy (1971-)
- *14001 Digestive System-General; Methods
- *16001 Respiratory System-General; Methods
- *18501 Integumentary System-General; Methods
- *21004 Psychiatry-Addiction-Alcohol, Drugs, Smoking, etc
- *22005 Pharmacology-Clinical Pharmacology (1972-)
- *22024 Pharmacology-Neuropharmacology
- *22026 Pharmacology-Psychopharmacology
- *22100 Routes of Immunization, Infection and Therapy
- *22501 Toxicology-General; Methods and Experimental
- 10060 Biochemical Studies-General

Biosystematic Codes:

- 86215 Hominidae

Super Taxa:

Animals; Chordates; Vertebrates; Mammals; Primates; Humans

10928907 BIOSIS Number: 97128907
Meta-analysis on efficacy of nicotine replacement therapies in
smoking cessation (Full version of this paper published
electronically in Online Journal of Current Clinical Trials
(January 14): 1994 Document No. 113.)

Silagy C; Mant D; Fowler G; Lodge M

Dep. Gen. Practice, Flinders Univ. South Aust., Sch. Med., GPO
Box 2100, Adelaide, SA 5001, AUL

Lancet (North American Edition) 343 (8890). 1994. 139-142.

Full Journal Title: Lancet (North American Edition)

ISSN: 0099-5355

Language: ENGLISH

Print Number: Biological Abstracts Vol. 097 Iss. 006 Ref. 078768

Nicotine-replacement therapy (NRT) by gum, transdermal patch, intranasal spray, or inhalation is expensive but how effective is it? We have done a meta-analysis of controlled trials to see how effects on abstinence rates are influenced by the clinical setting, the level of nicotine dependency, the dosage of NRT, and the intensity of additional advice and support offered. Published or unpublished randomized controlled trials of NRT that have assessed abstinence at least 6 months after the start of NRT were identified and 53 trials (42 gum, 9 patch, 1 intranasal spray, 1 inhaler), with data from 17 703 subjects, were included in the analyses. Use of NRT increased the odds ratio (OR) of abstinence to 1.71 (95% confidence interval 1.56-1.87) compared with those allocated to the control interventions. The ORs for the different forms of NRT were 1.61 for gum, 2.07 for transdermal patch, 2.92 for nasal spray, and 3.05 for inhaled nicotine. These odds were non-significantly higher in subjects with higher levels of nicotine dependence but they were largely independent of the intensity of additional support provided or the setting in which NRT was offered. We conclude that the currently available forms of NRT are effective therapies to aid smoking cessation.

Descriptors/Keywords: META-ANALYSIS; HUMAN; NICOTINE DEPENDENCY; THERAPEUTIC METHOD; METHOD EFFICACY

Concept Codes:

- *07004 Behavioral Biology-Human Behavior
- *20506 Nervous System-Pathology
- *21004 Psychiatry-Addiction-Alcohol, Drugs, Smoking, etc
- *22024 Pharmacology-Neuropharmacology

10060 Biochemical Studies-General
12512 Pathology, General and Miscellaneous-Therapy (1971-)
Biosystematic Codes:
86215 Hominidae
Super Taxa:
Animals; Chordates; Vertebrates; Mammals; Primates; Humans

Post-Selection Processing **Considerations**

1. Log-In/Receipt History

- adapted to system designed for routine processing of print journals**

- log-in of downloaded paper copy**

- each article included in receipt history**

- each download receives "accession #" and label**

VIEW LOG-IN HISTORY (HISTORY)

TITLE: **ONLINE Journal of CURRENT CLINical TRIALS**
CODEN: OJCTEI JCODE: ON33040
GEO: 001 UNITED STATES
PROC: 009 WHITE

FREQ: IF
ISSN: 1059-2725

C	M	R	ACC NO	MAILDT	D	VOLUME	ISSUE	PUBYR
			15588P	060794		0	JUNE 4	1994
			15868U	060994		0	JUNE 9	1994
			16240R	061494		0	JUNE 14	1994
			16380D	061594		0	JUNE 15	1994
			17318B	062394		0	JUNE 23	1994
			17920P	062994		0	JUNE 29	1994
			18144B	070194		0	JULY 1	1994
			19434N	071594		0	JULY 15	1994

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			11456K	042894		0	APRIL 27	1994
			11745R	050294		0	APRIL 26	1994
			11455J	042894		0	APRIL 28	1994
			12285N	050594		0	MAY 5	1994
			14047J	052394		0	MAY 21	1994
			15221J	060294		0	MAY 27	1994

Post-Selection Processing **Considerations (cont.)**

2. Coverage Statistics

- tracks coverage "profile" for the journal**
- also adapted to journal processing system**
- the "number available" -- includes all appropriate articles including: orig. research & MMWR articles**
- the "number taken" includes product destination**

SELECTION SYSTEM (DETAIL)

ACC NO	LOGDT	MAILDT	VOLUME	ISSUE	PUB YEAR	
94 - 10540A	041994	041994	0	APRIL 16	1994	
94 - 11064X	042594	042594	0	AFRIL 23	1994	
94 - 11455J	042894	042894	0	APRIL 28	1994	
94 - 11456K	042894	042894	0	APRIL 27	1994	
94 - 11745R	050294	050294	0	APRIL 26	1994	
94 - 12285N	050594	050594	0	MAY 5	1994	
94 - 14047J	052394	052394	0	MAY 21	1994	
94 - 15221J	060294	060294	0	MAY 27	1994	

ACC NO	NM	AVAIL BA/CS	BA	CS	TOTAL BA/CS	AVAIL BK/MT	BK	MT	TOTAL BK/MT	AVAIL TOTAL	TOTAL
10540A - 001	C	1	0	0	0	0	0	0	0	1	0
11064X - 001	C	0	0	0	0	0	0	0	0	0	0
11455J - 001	C	1	0	0	0	0	0	0	0	1	0
11456K - 001	C	1	0	0	0	0	0	0	0	1	0
11745R - 001	C	2	0	0	0	0	0	0	0	2	0
12285N - 001	C	1	0	0	0	0	0	0	0	1	0
14047J - 001	C	1	0	0	0	0	0	0	0	1	0
15221J - 001	C	2	0	0	0	0	0	0	0	2	0

MENU > CLR PF1 > /\ PF2 > \/\ PF3 > RETURN PF4 > ISS DET PF6 > TITLE

SELECTION SYSTEM (DETAIL)

ACC NO	LOGDT	MAILDT	VOLUME	ISSUE	PUB YEAR	COVER DATE
94 - 15588P	060794	060794	0	JUNE 4	1994	
94 - 15868U	060994	060994	0	JUNE 9	1994	
94 - 16240R	061494	061494	0	JUNE 14	1994	
94 - 16380D	061594	061594	0	JUNE 15	1994	
94 - 17318B	062394	062394	0	JUNE 23	1994	
94 - 17920P	062994	062994	0	JUNE 29	1994	
94 - 18144B	070194	070194	0	JULY 1	1994	
94 - 19434N	071594	071594	0	JULY 15	1994	

ACC NO	NM	AVAIL BA/CS	BA	CS	TOTAL BA/CS	AVAIL BK/MT	BK	MT	TOTAL BK/MT	AVAIL TOTAL	TOTAL
15588P - 001		1	1	0	1	0	0	0	0	1	1
15868U - 001	C	3	0	0	0	0	0	0	0	3	0
16240R - 001	C	1	0	0	0	0	0	0	0	1	0
16380D - 001	C	1	0	0	0	0	0	0	0	1	0
17318B - 001	C	2	0	0	0	0	0	0	0	2	0
17920P - 001	C	1	0	0	0	0	0	0	0	1	0
18144B - 001	C	1	0	0	0	0	0	0	0	1	0
19434N - 001	C	1	0	0	0	0	0	0	0	1	0
MENU > CLR	PF1 > /\			PF2 > \/\	PF3 > RETURN		PF4 > ISS DET		PF6 > TITLE		

Processing Considerations

1. Format of Article

**-downloaded version processed after log-in:
cite/text input, indexing**

**-must "clean-up" the abstract before data
entry: headings, numbering, OCLC
conventions**

**-arrangement of article is specialized:
abstract, introduction, objective, materials,
methods, results, discussion, conclusion,
appendices, references, tables**

**-CORRECTIONS -- OJCCT has published--not
covered by us since didn't affect our material**

<article><front><cite>Silagy C, Mant D, Fowler G, Lodge M. The effectiveness of nicotine replacement therapies in smoking cessation [article]. Online J Curr Clin Trials [serial online] 1994 Jan 14;<voln>1994</voln>(Doc No <docn>113</docn>):[7906 words; 110 paragraphs]. 5 figures; 8 tables.</cite>

<ti>THE EFFECTIVENESS OF NICOTINE REPLACEMENT THERAPIES IN SMOKING CESSATION</ti>

<aubl><au><fnm>Christopher</fnm> <snm>Silagy</snm>, </au> <au><fnm>David</fnm> <snm>Mant</snm>, </au> <au><fnm>Godfrey</fnm> <snm>Fowler</snm>, </au> <au><fnm>Mark</fnm> <snm>Lodge</snm></au>

<aff>Department of Public Health and Primary Care, Radcliffe Infirmary, Oxford University, Oxford OX2 6HE, United Kingdom</aff> </aubl>

<class>Metaanalysis</class>

<keyword><phrase>metaanalysis</phrase>, <phrase>nicotine</phrase>, <phrase>smoking cessation</phrase><dcode>MET</dcode></keyword>

<pubdate>19940114</pubdate> </front>

<sec><p><pid>1</pid> Parallel Publication: The abridged version of this paper appeared as follows: Silagy C, Mant D, Fowler G, Lodge M, Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. Lancet 1994 Jan 15;343(8889):139-142.</p></sec>

<abstract> <st>ABSTRACT</st>

<p><pid>2</pid> Objective: To determine the effectiveness of nicotine replacement therapies (NRTs) (including gum, transdermal patch, intranasal spray, and inhaled preparations) in facilitating smoking cessation, and to determine whether the effect was influenced by the clinical setting in which the smoker was recruited and treated, the level of nicotine dependency, the dosage of NRT used, or the intensity of additional advice and support offered to the smoker.</p>

<p><pid>3</pid> Data Sources: Published trials of NRT were identified by a systematic search of 7 electronic databases, published reviews, reference lists from clinical trials, conference abstracts, smoking and health bulletins, and a bibliography on smoking and health.

Silagy C, Mant D, Fowler G, Lodge M. The effectiveness of nicotine replacement therapies in smoking cessation [article]. Online J Curr Clin Trials [serial online] 1994 Jan 14;1994(Doc No 113):[7906 words; 110 paragraphs]. 5 figures; 8 tables.

THE EFFECTIVENESS OF NICOTINE REPLACEMENT THERAPIES IN SMOKING CESSATION

Christopher Silagy, David Mant, Godfrey Fowler, Mark Lodge Department of Public Health and Primary Care, Radcliffe Infirmary, Oxford University, Oxford OX2 6HE, United Kingdom

Metaanalysis

metaanalysis, nicotine, smoking cessationMET

19940114

(1) **"Parallel Publication:"** The abridged version of this paper appeared as follows: Silagy C, Mant D, Fowler G, Lodge M, Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. Lancet 1994 Jan 15;343(8889):139-142.

ABSTRACT

(2) **"Objective:"** To determine the effectiveness of nicotine replacement therapies (NRTs) (including gum, transdermal patch, intranasal spray, and inhaled preparations) in facilitating smoking cessation, and to determine whether the effect was influenced by the clinical setting in which the smoker was recruited and treated, the level of nicotine dependency, the dosage of NRT used, or the intensity of additional advice and support offered to the smoker.

(3) **"Data Sources:"** Published trials of NRT were identified by a systematic search of 7 electronic databases, published reviews, reference lists from clinical trials, conference abstracts, smoking and health bulletins, and a bibliography on smoking and health. Unpublished trials were identified by approaching manufacturers of NRT.

(4) **"Study Selection:"** A total of 53 trials (42 gum, 9 patch, 1 intranasal spray, and 1 inhaler), with data from 17,703 patients, were included in the analyses. Only trials that assessed abstinence at least 6 months after the commencement of therapy were included.

(5) **"Data Extraction:"** Data were extracted from the trial reports by 2 authors independently. Where the methodology was unclear or the results were not expressed in a form which allowed extraction of key data we wrote to the investigators for the required information.

(6) **"Data Synthesis:"** Use of NRT increased the odds ratio (OR) of abstinence to 1.71 (95% confidence interval [CI], 1.56 to 1.87) compared with those who had been allocated

to the control interventions. The OR for the different forms of NRT were 1.61 for nicotine gum (95% CI, 1.46 to 1.78), 2.07 (95% CI, 1.62 to 2.62) for transdermal patch, 2.92 (95% CI, 1.49 to 5.74) for nasal spray, and 3.05 for inhaled nicotine (95% CI, 1.42 to 6.57). These odds were not significantly higher in patients with higher levels of nicotine dependence (Fagerstrom score ≥ 7 ; $P = 0.06$), but they were largely independent of the intensity of additional support provided or the setting in which the NRT was offered.

(7) **Conclusion:** We conclude that the currently available forms of NRT are effective therapies to aid smoking cessation.

INTRODUCTION

(8) Nicotine replacement therapy (NRT) is frequently used as an important component of smoking cessation strategies. It minimizes many of the physiological and psychomotor withdrawal symptoms usually experienced following smoking cessation and, therefore, may increase the likelihood of remaining abstinent. 1

(9) The 1st type of NRT to become widely available was chewing gum. The nicotine resin complex is presented in a buffered chewing gum base to enable the nicotine to be absorbed directly through the buccal mucosa, resulting in plasma concentrations which are approximately half that produced by smoking a cigarette. 2 Nicotine chewing gum is available either as a 2 mg or 4 mg preparation, and in many countries the lower dose is sold over-the-counter, without a prescription from a medical practitioner. Several factors limit the usefulness of nicotine chewing gum in some smokers, including oral and gastric side effects, 3 impaired absorption when taken with coffee or acidic beverages, 4 and a risk that some smokers may transfer their dependency from cigarettes to the gum. 4

(10) More recently, other forms of NRT, aimed to avoid many of the problems associated with nicotine gum, have been developed, including transdermal nicotine patches, intranasal nicotine spray, and nicotine inhaler devices. The last 2 are still undergoing research and have not been licensed for general clinical use.

(11) Transdermal patches were approved for use as an aid to smoking cessation by the Food and Drug Administration in the United States in 1992. Available in several different sizes, the patches deliver between 7 mg and 22 mg of nicotine over a 24-hour period and result in plasma levels similar to the trough levels seen in heavy smokers. 5

(12) The introduction of transdermal patches has been accompanied by strong marketing campaigns over the past 12 months in a number of countries,

targeted both at smokers and physicians, encouraging use of the patch as a "proven and effective" smoking cessation strategy. 6 This has caused much debate about the role of NRT in smoking cessation; including which group(s) of smokers should be offered NRT, which preparations should be used, in what dose regimen, and whether NRT is effective when used alone or only together with some form of additional support strategy.

(13) There have been several previous attempts to systematically review the effectiveness of nicotine gum 7-8 and transdermal patches. 5, 9 In 1987, a metaanalysis of 14 trials of nicotine chewing gum concluded that this form of NRT was most effective when used in specialized smoking-cessation clinics, and was of questionable value when used in general medical practice. 8 These findings were reinforced in a more recent review of pharmacological aids to smoking cessation. 1 However, since both of these reviews, there have been over 20 new randomized controlled trials examining the effect of nicotine gum in facilitating smoking cessation.

(14) Two systematic reviews of randomized controlled trials of transdermal nicotine patches were published in 1992. 5, 9 The results suggest that this form of NRT is also highly effective but neither of the reviews used comprehensive methods to identify all the relevant published and unpublished trials, nor did they use quantitative techniques to synthesize the data and test for homogeneity or statistical significance.

(15) Since NRT is widely available and costly, it is important to establish the effectiveness of the different forms of NRT when offered to smokers who have varying levels of dependency and motivation to quit, in a range of clinical settings, and with or without additional support programs.

OBJECTIVE

(16) To determine the effectiveness of NRT (including gum, transdermal patch, intranasal spray, and inhaled preparations) in achieving long-term smoking cessation, we wished to test the following hypotheses (see Appendix A):

(17) 1. use of NRT is more effective than placebo or "no NRT" intervention in promoting smoking cessation (Comparison 1);

(18) 2. NRT is more effective when offered to smokers who are motivated to quit and will, therefore, be more effective in clinical settings which selectively recruit motivated smokers (Comparison 2);

(19) 3. NRT is more effective in highly dependent smokers compared with those who are only moderately dependent (Comparison 3); and

(20) 4. the provision of high-intensity support, in addition to the use of NRT, will be more effective in producing abstinence than addition of low-intensity support programs (Comparison 4).

MATERIALS

Criteria for Considering Trials for This Review

Types of Intervention

(21) bullet All randomized controlled comparisons of NRT (including nicotine chewing gum, transdermal nicotine patches, nicotine nasal spray, and nicotine inhalers) versus placebo or no NRT control.

(22) bullet Randomized trials of different doses of NRT.

Types of Patients

(23) Smokers of either gender were included irrespective of the setting from which they were recruited and/or their initial level of nicotine dependency. Studies which randomized therapists, rather than smokers, to offer NRT or a control were included providing that the specific aim of the study was to examine the effect of NRT on smoking cessation. Trials which randomized physicians or other therapists to receive an educational intervention, which included encouraging their patients to use NRT, were not included but are being handled as part of a separate review.

Types of Outcome Measures

(24) We confined the review to a comparison of the effects of NRT versus control on smoking cessation, rather than withdrawal symptoms. Trials in which follow-up was of short duration (less than 6 months), or which did not include measurement of smoking cessation, were also excluded. Trials for which no data were available were excluded (Table 1).

(25) In each study the strictest available criteria to define abstinence were used. For example, in studies where biochemical validation of cessation was available, only those participants who met the criteria for biochemically confirmed abstinence were regarded as being abstinent. Wherever possible a sustained cessation rate, rather than point prevalence, was used. In trials where patients were lost to follow-up they were regarded as being continuing smokers.

Search Strategy for Identification of Trials

(26) A computerized literature search was conducted with DataStar

Elwood M, Cox B, Richardson A. The effectiveness of breast cancer screening by mammography in younger women: Correction [letter]. Online J Curr Clin Trials [serial online] 1994 Mar 31;3(Doc No 121)[385 words; 4 paragraphs] 5 tables.

THE EFFECTIVENESS OF BREAST CANCER SCREENING BY MAMMOGRAPHY IN YOUNGER WOMEN: CORRECTION

age factors, breast neoplasms, mammography, mass screening, oncology, radiography, randomized trialsERR

19940331

(1) When updating the analysis in the original article 1, we detected a small error in Table 10, in the line referring to Malmö. As a result of the correction of that error, the last line (Total) of the table also changed. Corrections to Table 10 appear in boldface.

(2) Associated alterations of the text occur in paragraph 62, quoted below. The corrections appear in boldface.

Corrected Paragraph 62, Doc No 32

(3) The breast cancer mortality experience of older women was analyzed identically to that of younger women. Table 10 presents the effect of screening older women from 5 of the 6 published studies at 7 years of follow-up. ****Overall, a reduction in breast cancer mortality of 31% was achieved, with 95% CI, from a 17% to a 42% reduction.**** The reductions ranged from 20% in Edinburgh to 43% in Stockholm, being significant overall and in the HIP and S2C trials. Inclusion of the results of the Canadian study produced little change in the effect and only resulted in a slight increase in the ****overall relative risk to 0.72 (95% CI, 0.61 to 0.82)****, although it may not be entirely appropriate to add the Canadian data as that trial compares 2 different modalities of screening. Table 8a, Table 8b, and Table 8c show the ratio of cumulative breast cancer mortality rates in the intervention compared to the control groups for older women in the RCTs. A small excess mortality is seen in the 1st year, but a sustained reduction in mortality occurred from the 2nd year of follow-up which was confirmed by the mortality rate ratios for the individual years of follow-up (Table 11). The mortality rate ratios did not vary significantly, and showed no evidence of a trend, with increasing years of follow-up. This pattern of relative risk with successive years of follow-up is different from that seen among younger women.

(4) These changes do not alter the conclusions reached in the article.
Mark Elwood Brian Cox Ann Richardson Hugh Adam Cancer Epidemiology Unit,

Processing Considerations (cont.)

2. Indexing

- like any other article for database**
- use downloaded copy**
- add keyword: "serial-online"
(hyphenated for retrieval)**

Processing Considerations (cont.)

3. Document Delivery

- available for document delivery from downloaded version (articles are usually long)**
- store articles from single release together--like any other issue of journal (sometimes only one)**
- OJCCT available on Internet: could probably download--no need for document delivery**

II. Future Coverage of Electronic Journals

-coverage of individual electronic journals a problem: variation in formats, delivery mechanisms, etc. for each

-most likely scenario: from large publisher to transmit a number of journals

-trial proposal of tapes in SGML format

-feasibility greater now: either tape or electronic transmission

II. Future Coverage of Electronic Journals (cont.)

- drawbacks identified in study still true:**
 - hard copy of article**
 - critical mass to be cost-effective**
 - inconsistencies & variations in content**
 - dual processing (most of material processed is still print journal form)**
 - variation with multiple providers**
- "header" information more cost-effective**
 - several publishers now offering**

II. Future Coverage of Electronic Journals (cont.)

- most considerations faced with OJCCT but on larger scale:**
 - quality/consistency of distribution & content**
 - selection: e.g., select parts of the journal, unless taking everything**
 - log-in/acquisitions/receipt history (for both electronic & hard copy subscriptions)**
 - variable receipt timing**
 - coverage statistics**

II. Future coverage of Electronic Journals (cont.)

-possible system adaptation:

- streaming of data into system**
- content for log-in/receipt files ??**
- serials control for journal information (title, editor, profile changes, etc.) ??**
- procedures for coping with format variation (particular procedures in A&I's based on products: e.g., tags, special sections, special issues, meetings)**
- uploading for citation and abstract input (clean up data for format compatibility)**
- uploading for indexing ??**
 - esp. for material with only abstracts (meetings)**
 - esp. if parallel processing desirable**
- uploading for translations ??**
 - possible "mini-system": selection, cite & abstract input, indexing)**
- uploading for post-processing analysis ??**
 - for special products/projects done after mainline processing**

III. Summary of Issues

-quality; resources; standards; property rights

Inconsistency in formats

-experimental formats--meant to be "more meaningful"

-variety of formats: individual publications; large publishers

Inconsistency in delivery

-large publishers dependable; still coordinate hard copy and electronic

-individual publications bigger problem:

-predicting volume: affects resources, production planning

III. Summary of Issues (cont.)

Adapting processing system

- irregularity in schedules, content, formats**
- large effort for system development & data processing**
 - dual processing**
- rely on few publishers--critical mass**
- need hard copy for indexing, post production**
- lack of standards**
 - formats & delivery mechanisms**

Copyright / Liability

- copyright problems for infrequent publications**
- agreement with large publishers**
- probable encoding to assure notice of ownership**
- storage of electronic full text -- A&I or publisher?**
- liability issues much as are now**
 - more problematic for individual, truly electronic publications**

The Technical Manual Publishing On Demand System (TMPODS)

Steve Sherman

Defense Printing Service (DPS)

Steve Sherman offered a description of the DPS, beginning with its establishment in April 1992. As the former Navy Publishing and Printing Service, DPS is the consolidated organization for printing and duplicating in the Department of Defense.

Sherman described the DPS corporate structure, mission, advantages, and major automation initiatives, including the Technical Manual Publishing On Demand System (TMPODS).

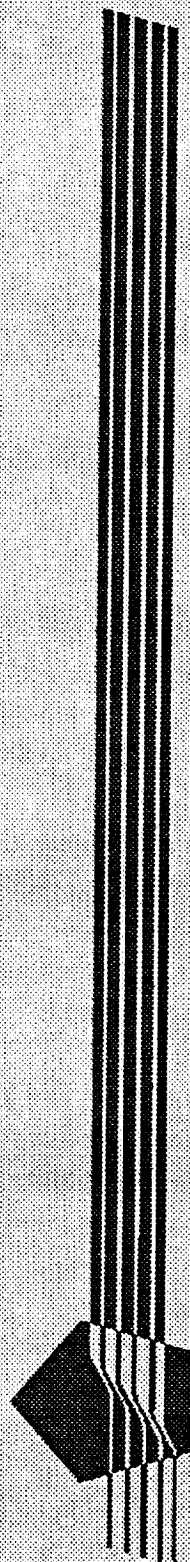
The basic system design for TMPODS involves technical manual entry, scanning, storage, order processing, data management, and production. Under TMPODS, Navy technical manuals are stored in a digital database in a raster format on CD-ROMS configured in "jukeboxes."

This new digital approach has reduced a variety of costs associated with Navy technical manuals, including printing, dissemination, and, especially, storage — since the paper-based documents were eliminated. Sherman explained how these documents are produced on demand at hundreds of DOD facilities throughout the world — even aboard ships at sea.

Other benefits of TMPODS include the delivery of fully updated technical manuals, rapid order turnaround, delivery in either hardcopy or digital format, the capability to bundle technical manual collections, and greatly reduced distribution costs.



Defense Printing Service



Progress... NOW!

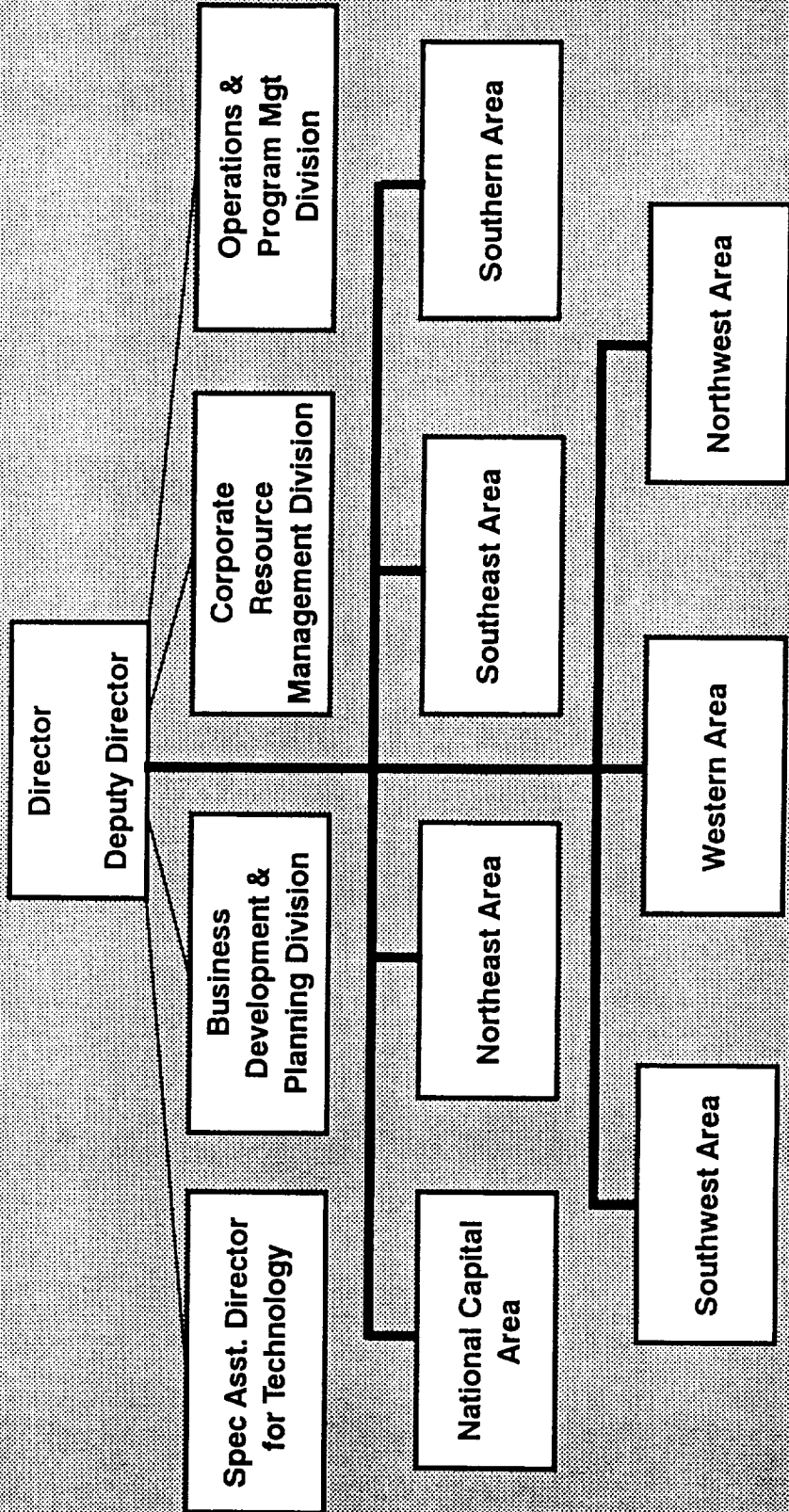


Defense Printing Service (DPS)

- Defense Management Report Decision 998 - Effective 6 April 92
 - Established DPS (formerly Navy Publishing and Printing Service)
 - Consolidated Organization for Printing and Duplicating in DOD
 - Responsible for a coordinated DOD program covering production, procurement and distribution of publications through conventional and alternative means
 - Provide products on a "fee for service" basis under the Defense Business Operations Fund (DBOF)
- Organizational Structure
 - DPS Headquarters - Washington Navy Yard
 - 7 Area (Regional) Offices
 - 100 Detachment & Branch Offices (270 total locations)



Corporate Board





Mission

The Defense Printing Service is responsible for the Department of Defense duplicating and printing program, and document automation, encompassing value-added conversion, electronic storage, output and distribution of hardcopy and digital information.

Value to the customer includes quality products and services, which are competitively priced, and delivered on time.



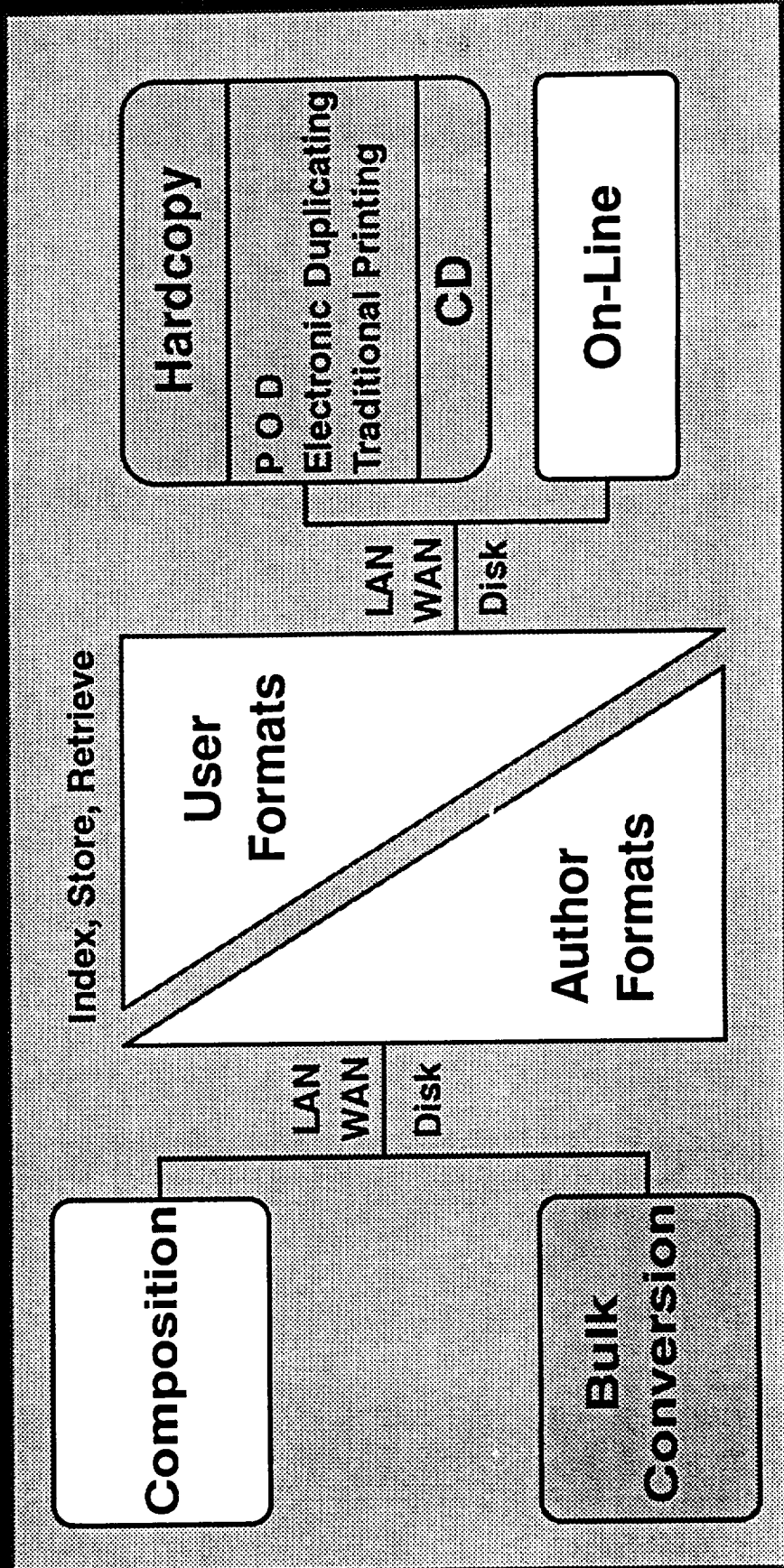
DPS Advantages

- **Worldwide presence**
 - Co-located with major DOD activities
- **Chartered as DBOF activity in 1992**
 - Fee for service
- **Track record as cost-effective, innovative business**
 - DPS makes up front investment in systems and people
 - Customer pays unit rate for services rendered
- **DOD leader in conversion/output technology**



DPS Strategic Planning

DoD Digital Information Flow





Data Format Characteristics

Authoring Format

Characteristics

Editable/Reviseable

Still developing technology

Variety of Options

User Format

Characteristics

Designed for View & Print

WYSIWYG-Just as Intended

Navigatable

Simple Implementation

Legacy Conversion Issues

Major conversion costs

Major QA - ASCII & tagging

Low Conversion costs

Little QA

Examples

Word Processing, SGML

Publishing Formats

Vector Format Drawings

Indexed Raster,

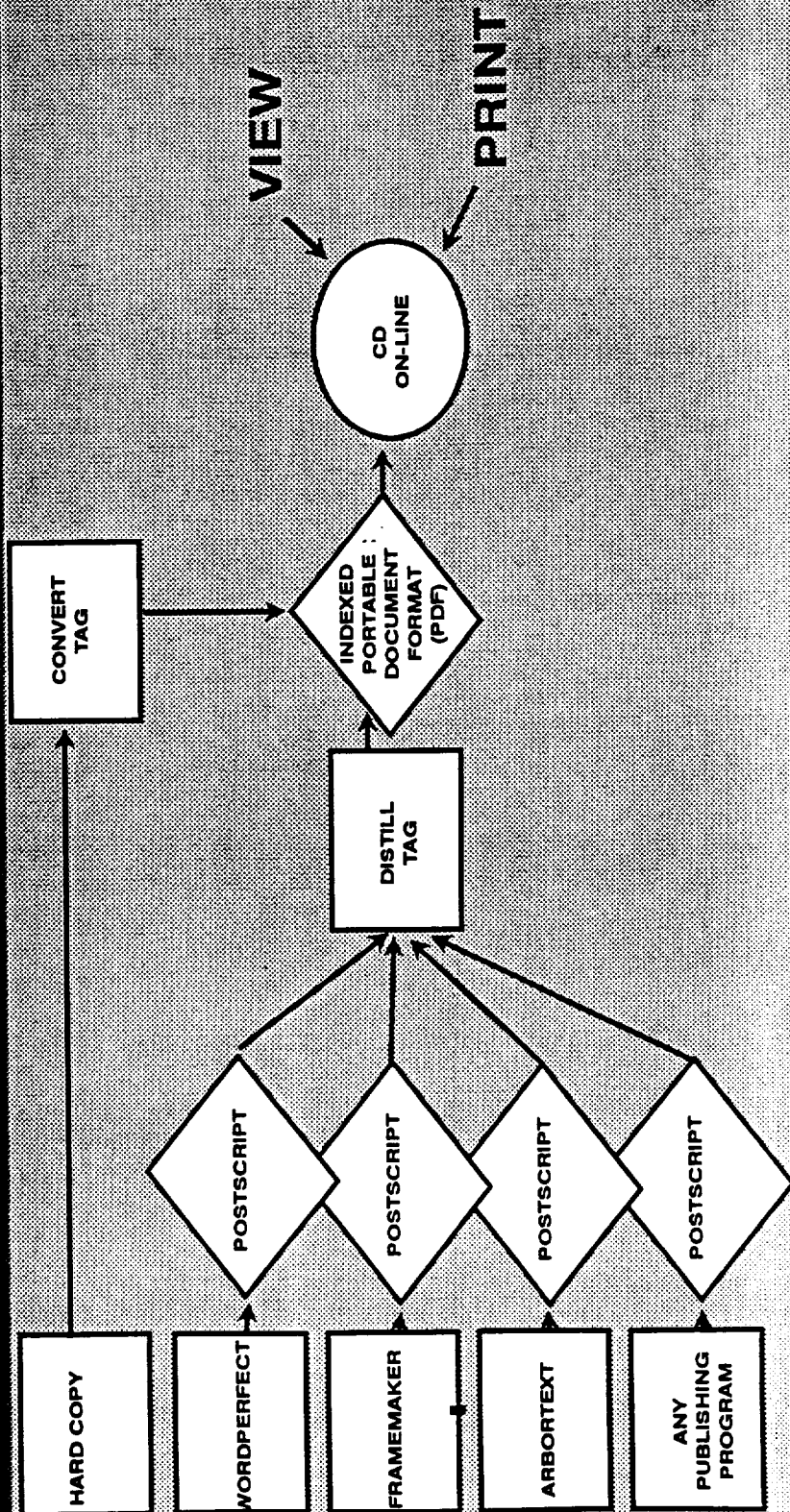
Intelligent Raster, PDF

SGML



DPS Services

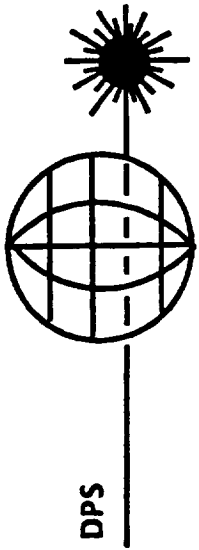
PDF User Format Advantages





Major Automation Initiatives

- Automated Document Management & Publishing Systems (ADMAPS)
- Automated Document Conversion (ADC) Test
- Technical Manual Publish On Demand System (TMPODS)
- Electronic Document Repository and Distribution System (EDRADS)
- Electronic Page Printing Systems (EPPS)
- Shipboard Electronic Publishing Center (SEPC)

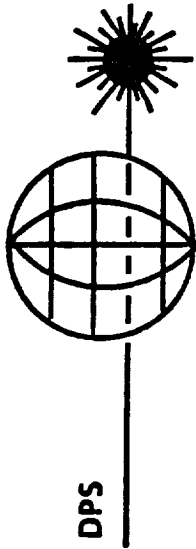


TECHNICAL MANUAL PUBLISH ON DEMAND SYSTEM

TMPODS

Sponsored by

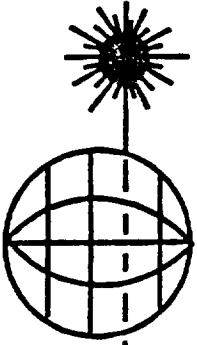
Defense Printing Service



TMPODS

Overview

- **Digital Database of Navy Technical Manuals**
 - Initially in Raster Format**
 - Eventually in ASCII/SGML & IETM**
 - Supports CALS Data Standards**
- **Fill Individual MILSTRIP Requests**
 - Focus on Secondary Distribution**
 - Paper Output - W/Changes Collated Into Basic TMs**
- **Capability to Ship 'Bundled' Digital TMs**
 - Digital Output For CD-ROM**
 - Supports ATIS/ATIS - AIR User Platform**



DPS

TMPODS

Objectives

- **Deliver Fully Updated Manuals**

- Increase Accuracy of Revision Level

- Reduce Admin/Handling Time

- Reduce Printing and Mailing of Changes

- **Eliminate Deficiencies in Warehouse Stocking**

- Reduce Disposal of Obsolete Pubs by 1.2 M Manuals Annually

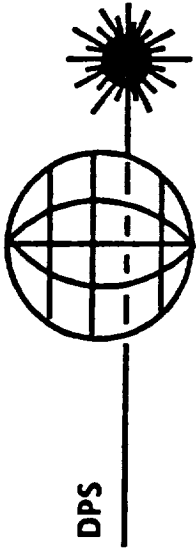
- Eliminate Physical Storage and Manual Retrieval

- Improves Response Time

- **Operate Within the CALS Data Formats**

- Central Repository Supporting Common TM Formats

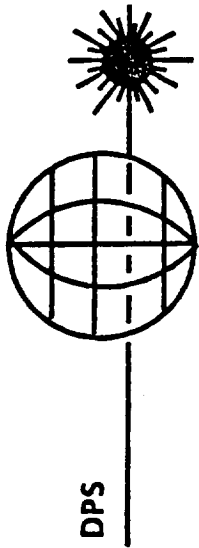
- Delivering Digital Data to the Fleet



TMPODS

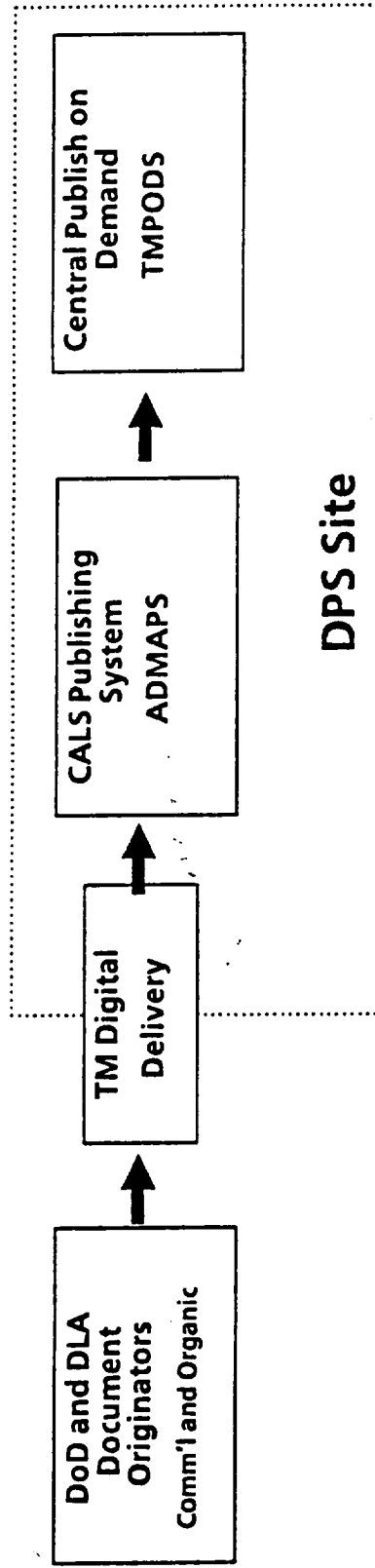
Conversion Strategy

- **Scan Existing TMs in Intelligent Raster Format**
- **Applicable CALS Specs, Initially**
 - Navy Implementation of Raster Specification
 - MIL-R-28002 - 'Raster Graphics Representation in Binary Format'
 - MIL-M-29532- 'Master Library Index Specification'
- **Accept New TMs in Full Intelligent Format**
 - Delivered From Industry Via ADMAPS
 - SGML - Per MIL-M-28001
 - Graphics in Raster, CGM, and IGES
 - IETM - Per Draft MIL-D-87268,69
- **PDL/PDF - Intelligent Storage and Output Format**



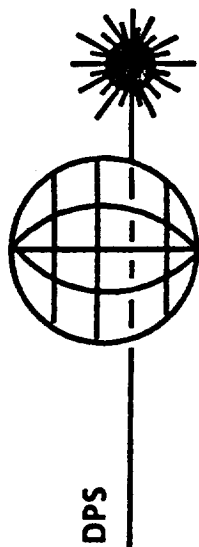
TMPODS

The ADMAPS Connection



- **ADMAPS: Automated Document Management and Publishing System**

- Assures CALS compliance of TMs submitted digitally
- Supports Document Editing and Creation in CALS Data Formats
- Provides TMs to TMPODS in a Common Data Format



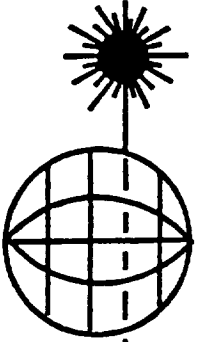
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TMPODS

Conversion Status

Technical Manual Digitization

<u>Sponsor</u>	<u>Total TMs</u>	<u>Selected</u>	<u>Converted</u>	<u>QA'd</u>	<u>On TMPODS</u>
NAVSEA	38.5K	38K	33.6K	22.6K	12K
NAVAIR	45K	43K	43K	43K	33.5K
SPAWAR	2.5K	1.5K	.2K	.15K	0
Total	86K	82.5	76.8	65.75	45.5K



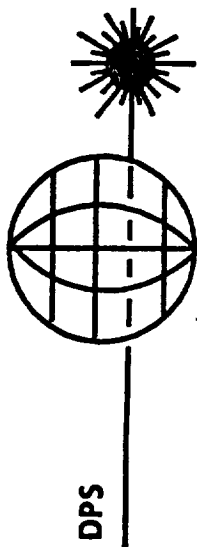
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TMPODS

Production Capability

Workload

- **306,000 MILSTRIP Orders in CY95**
85 + % of all TM MILSTRIP Requests
(Non-Std Printing, Classified, Large Volume Orders Excluded)
Issue 858K Manuals Annually
- **Printing Volume in CY95**
107M Impressions 8 1/2 X 11
32M Running ft Foldout pages
- **Digital Output Volume in CY95- 1040 CDs**

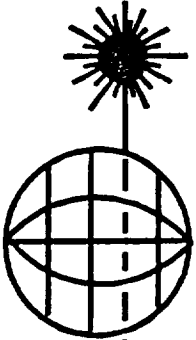


TMPODS Cost Benefits

	<u>CURRENT COST</u>	<u>TMPODS COST</u>
Cost per TM, Printing -	\$11.72	\$10.72
Cost per MILSTRIP Req -	\$41	\$35
Cost of Automatic Change Distribution		
	\$3.2M	\$0.0
Annual Cost of TMs Disposed -	\$14.2M	\$0.0
Annual Cost to the Navy to Fill Requests	\$40.6M	\$19.7M

Not Calculated Costs:

- Elimination of Manual Collation of Change Pages by Users
- Value of Digital Information vice Paper

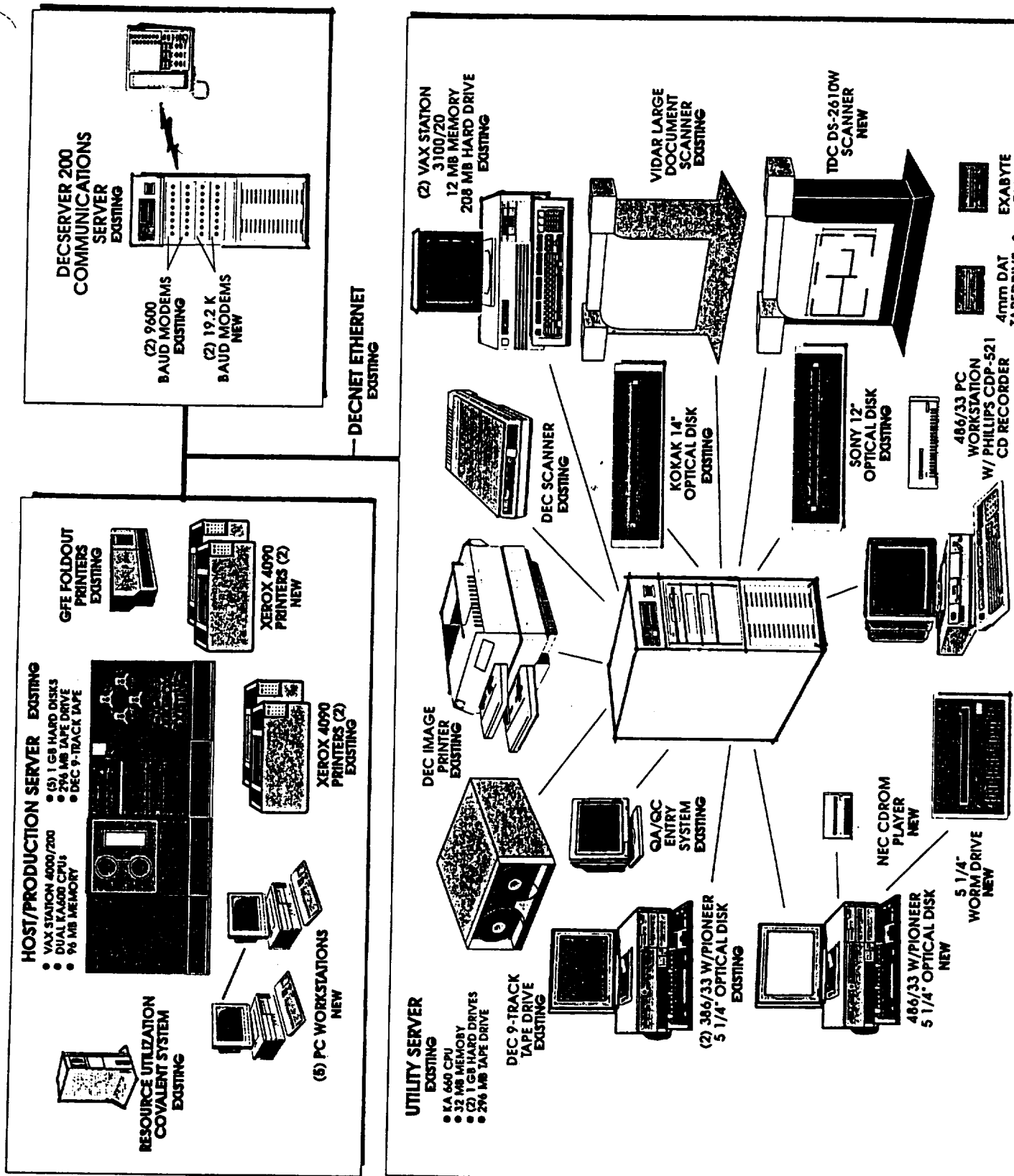


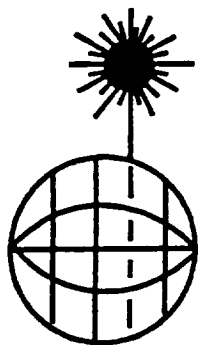
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TMPODS

System Design

- **Tech Manual Entry**
- **Scanning**
- **Storage**
- **Order Processing**
- **Data Management**
- **Production**



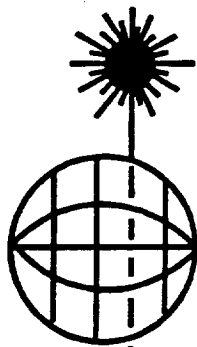


- **TMs Delivered Fully Updated**
- **Rapid Order Turnaround**
- **Hardcopy or Digital Delivery**
- **Bundling Capability (TM Collections)**
- **Common Data Formats Stored**

For Use by Authors

For Delivery to Users

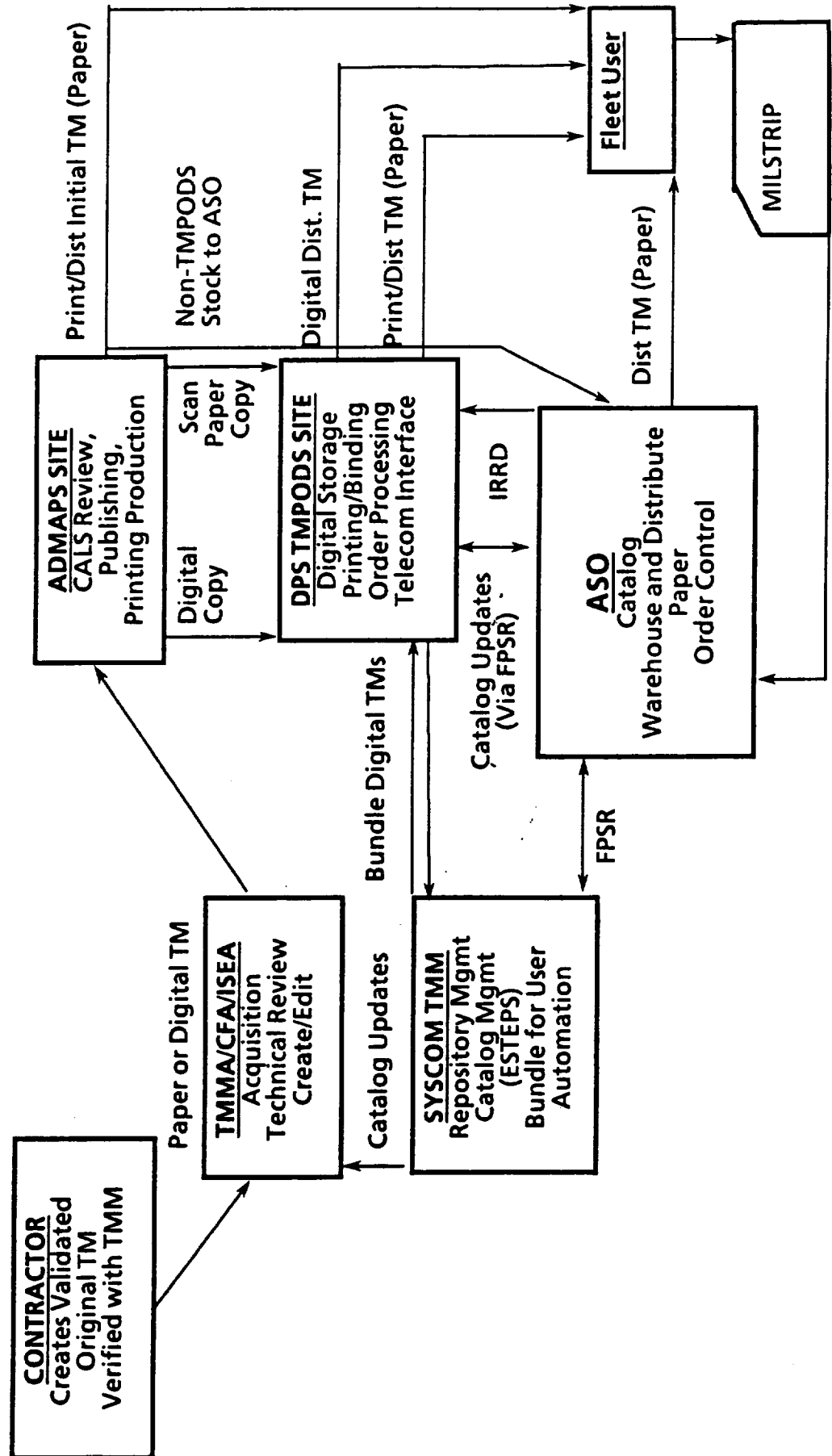
- **Reduces Warehouse Storage**
- **Reduces Obsolete Shelfstock**
- **Reduces Distribution Costs**



DPS

ADMAPS/TMPODS

Relationship to the Tech Manual World



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